

MEMOREX™

Service Manual

VIDEO CASSETTE RECORDER

VR-2050**Catalog Number: 16-7110**

SPECIFICATIONS



Television system:	CCIR, 625 lines, 50 fields, PAL colour and monochrome signals
Recording system:	Rotary helical scan system with two video heads One stationary head for normal track monaural sound
Format:	VHS PAL standard
Tuner:	Voltage synthesizer tuner with sequential channel selection Channel +/- selection with remote control 39 programme memories
Time indication:	24 hour display system
Timer:	1 year 8 programmes with every day function
Timer back-up time:	Approx. 5 minutes
Tape loading system:	Automatic loading
Auto Function:	Power On/Playback/Rewind/Eject/Power Off/Cancel

		UNIT	NOMINAL	LIMIT
Video output level:		Vp-p	1.0 (75Ω)	1.0 ± 0.15 (75Ω)
Video input level:		Vp-p	1.0 (75Ω)	0.5 ~ 2.0 (75Ω)
Audio output level:		dBs	- 4 (1kΩ)	- 4 ± 4 (1kΩ)
Audio input level:		dBs	- 4 (10kΩ)	- 4 ⁺¹² ₋₈ (10kΩ)
RF Modulator output level:	CH36	dBμ	73	73 ± 3
TV signal input level:	VHF	dBμ	75 (75Ω)	
	UHF	dBμ	75 (75Ω)	
Video S/N ratio:		dB	45.5	42
Audio S/N ratio:		dB	42	38
Audio frequency response:		Hz	50 ~ 11,000	80 ~ 10,000
Wow-Flutter:		%	0.2	0.35
Tape speed:		mm/sec	23.39	
Power source:	50Hz	V AC	240	240 ± 10%
Power consumption:	at REC mode	W	30	33
Operating temperature:		°F		41 ~ 95
		°C		5 ~ 35
Operating humidity:		%		80

NOTE: Nominal specs represent the design specs; all units should be able to approximate these — some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition that still might be considered acceptable; in no case should a unit perform to less than any limit spec.

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CONTENTS

	Page
1. Main Board Locations	5
2. Mechanism Dismantling and Reassembling	6 ~ 40
2-1. Mechanism Main Unit	6
2-2. Cassette Holder Mechanism	7
2-3. Compl Motor Bracket (Loading Motor Block)	13
2-4. Tape Loading Mechanism	16
2-5. Compl Head Bracket (ACE Head)	19
2-6. Pinch Roller Pressure Mechanism	20
2-7. Brake Mechanism	21
2-8. Reel Table Drive Mechanism	25
2-9. Capstan Motor	31
2-10. Fixed Guide, FE Head Lever Ass'y	32
2-11. Drum Section	35
2-12. How to Proceed when the Cassette Cannot be Removed	40
3. Block Diagram	41 ~ 52
3-1. Overall Wiring Diagram	41
3-2. System Control & Servo Circuit Basic Block Diagram	44
3-3. Video Circuit Basic Block Diagram	47
3-4. Audio Circuit Basic Block Diagram	50
4. Mechanism Maintenance and Checking	53 ~ 58
4-1. Periodic Checking and Maintenance Items and Service Jigs	53
4-2. Mode Selector (VHJ-0050) Handling Instructions	56
5. Mechanism Adjustment	59 ~ 68
5-1. Operating the Mechanism with no Cassette Inserted	59
5-2. Reel Table Height Adjustment and Torque Check	60
5-3. Tension Pole (Back Tension Guide) Position Adjustment and Back Tension Torque Check	62
5-4. Tape Path Adjustment	63
6. Electrical Adjustment	69 ~ 74
6-1. Preparation	69
6-2. Servo Circuit	69
6-3. Video Circuit	71
6-4. Audio Circuit	73
6-5. Tuner IF Circuit	73
6-6. Test Point for Tape Path Adjustment	74
7. Electrical Parts	75 ~ 82
8. Mechanical Parts List	83 ~ 87
8-1. Cabinet & Chassis Parts	83
8-2. Mechanism Parts 1	84
8-3. Mechanism Parts 2	85
8-4. Mechanism Parts 3	86
8-5. Remocon Unit	87
8-6. Accessorie	87

9. Schematic Diagram and Printed Circuit Board	89 ~ 122
9-1. CP-1 Main P.C.B.	89
9-2. COMPL. CP-A (VD-A) Video Circuit Diagram	91
9-3. COMPL. VP-1 Video Pre-Amp Circuit Diagram	93
9-4. VP-1 Video Pre-Amp P.C.B.	93
9-5. COMPL. CP-A (CV-A) RF Converter Connection Circuit Diagram	93
9-6. Waveform of Video Circuit	94
9-7. COMPL. CP-A (AD-A) Audio Circuit Diagram	95
9-8. COMPL. CP-A (SY-A) System Control Circuit Diagram	97
9-9. COMPL. CP-A (SV-A) Servo Circuit Diagram	99
9-10. COMPL. CP-A (PW-A) Power Supply Circuit Diagram	101
9-11. PW-1 Power Supply P.C.B.	101
9-12. PW-2 Power Supply P.C.B.	102
9-13. COMPL. PW-1 & COMPL. PW-2 Power Supply Circuit Diagram	103
9-14. COMPL. TM-1 Display, Timer & Tuning Control, COMPL. TM-2 IR Receiver & Eject Switch Circuit Diagram	105
9-15. COMPL. CP-A (TM-A) Sync. Separation & Tuning Select Circuit Diagram	107
9-16. TM-1 Display, Timer & Tuning Control P.C.B.	107
9-17. IF Circuit Diagram	109
9-18. TM-2 IR Receiver & Eject Switch P.C.B.	109
9-19. IF P.C.B.	110
9-20. COMPL. CP-A (TN-A) Tuner IF Connection Circuit Diagram	110
9-21. RF Converter Circuit Diagram	111
9-22. Mechanism Connection Circuit Diagram	113
9-23. IR Remote Control Circuit Diagram	114
9-24. IC301 (LC66508B) System Control MPU Pin Function Table	117
9-25. IC351 (LC7416) Digital Servo IC Pin Functions Table	118
9-26. IC711 (M50957) Timer MPU Pin Functions Table	119
9-27. IC351 (LC7416) Digital Servo IC Inter Block Diagram	120
9-28. Waveform of Servo Circuit	121

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements, electrical components having such features are identified by a Δ in the schematic diagram and the parts list.

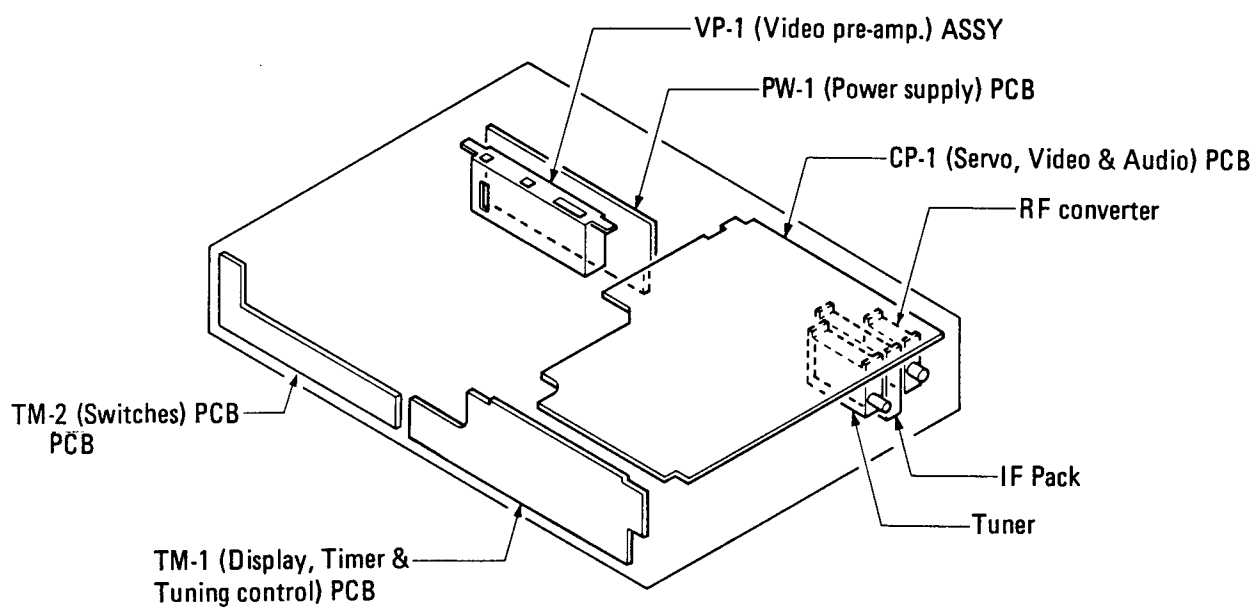
Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

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NOTES:

1. All resistance values are in "OHMS" unless otherwise noted. (K = 1,000 M = 1,000,000)
2. All capacitance values are in " μ fd" unless otherwise noted.
p = pico farad
3. All inductance values are in "mH" unless otherwise noted. μ = micro henry.

1. MAIN BOARD LOCATIONS



2. MECHANISM DISMANTLING AND REASSEMBLING

2-1. MECHANISM MAIN UNIT (See Fig. 2-1-1.)

1. Removal

- 1) Remove the connectors of the COMPL MC-2, the COMPL MC-3 and the COMPL HEAD BRACKET.
- 2) Remove the flexible P.C.B. ① connecting the COMPL CYLINDER to the HEAD AMP PCB ASS'Y ③ (See Fig. A).
- 3) Remove the two screws ②, then remove the HEAD AMP PCB ASS'Y ③.
- 4) Remove the screw ④, then remove the PRE-AMP. BRACKET ⑤.
- 5) Remove the two screws ⑥.
- 6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.

Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws.

Note : Shape of the HEAD AMP PCB ASS'Y ③ and the PRE-AMP. BRACKET ⑤ differ depending on the model.

2. Remounting

- 1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
- 2) Tighten the two screws ⑥.
- 3) Mount the PRE-AMP. BRACKET ⑤ with the two screws ④.
- 4) Mount the HEAD AMP PCB ASS'Y ③ and the ground lug with the two screws ② (some models are not provided with a ground lug).
- 5) Insert the flexible P.C.B. ① into the connector of the HEAD AMP PCB ASS'Y.
- 6) Connect the connectors of the COMPL MC-2, COMPL MC-3 and COMPL HEAD BRACKET.

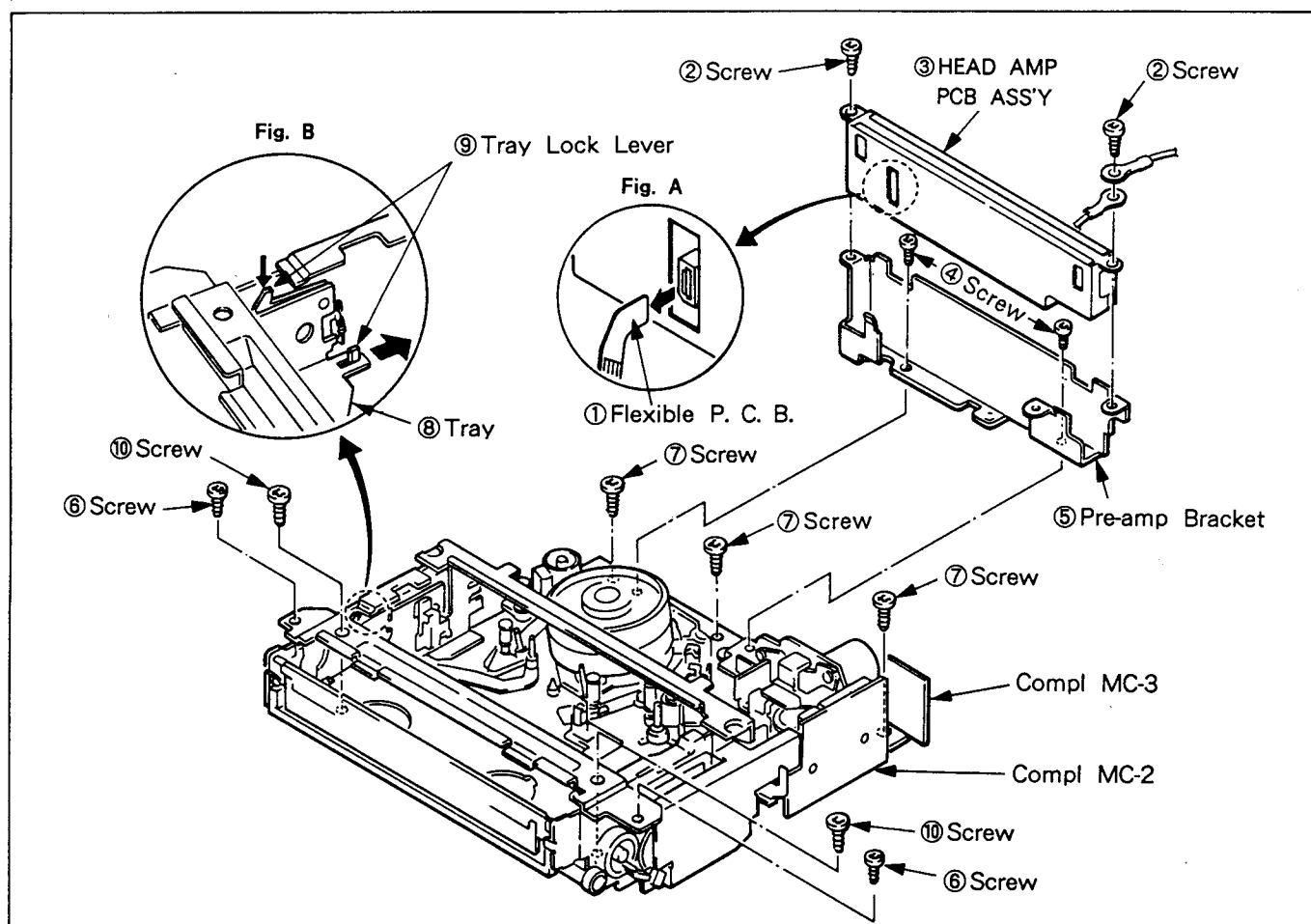


Fig. 2-1-1 Mechanism Main Unit

2.2. CASSETTE HOLDER MECHANISM

2.2-1. COMPL CASSETTE MECHANISM

(See Fig. 2-2-1.)

1. Removal

- 1) Set the video main unit to the EJECT completed mode.
- 2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.
- 3) Remove the two screws ①.
- 4) Remove the two screws ②.
- 5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front (See Fig. B). When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

- 1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from above, match the front loading gear hole ⑤ with the FRONT BRACKET ASS'Y hole ⑥ as shown in Fig. A).
- 2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.
- 3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance. Match positions of the FRONT LOADING GEAR Δ mark ⑦ and the RACK EJECT mark ⑧. (See Fig. A.)
- 4) Fix to the mechanism chassis with the two screws ②.
- 5) Fix to the chassis with the screw ①.
- 6) Connect to the various connectors.

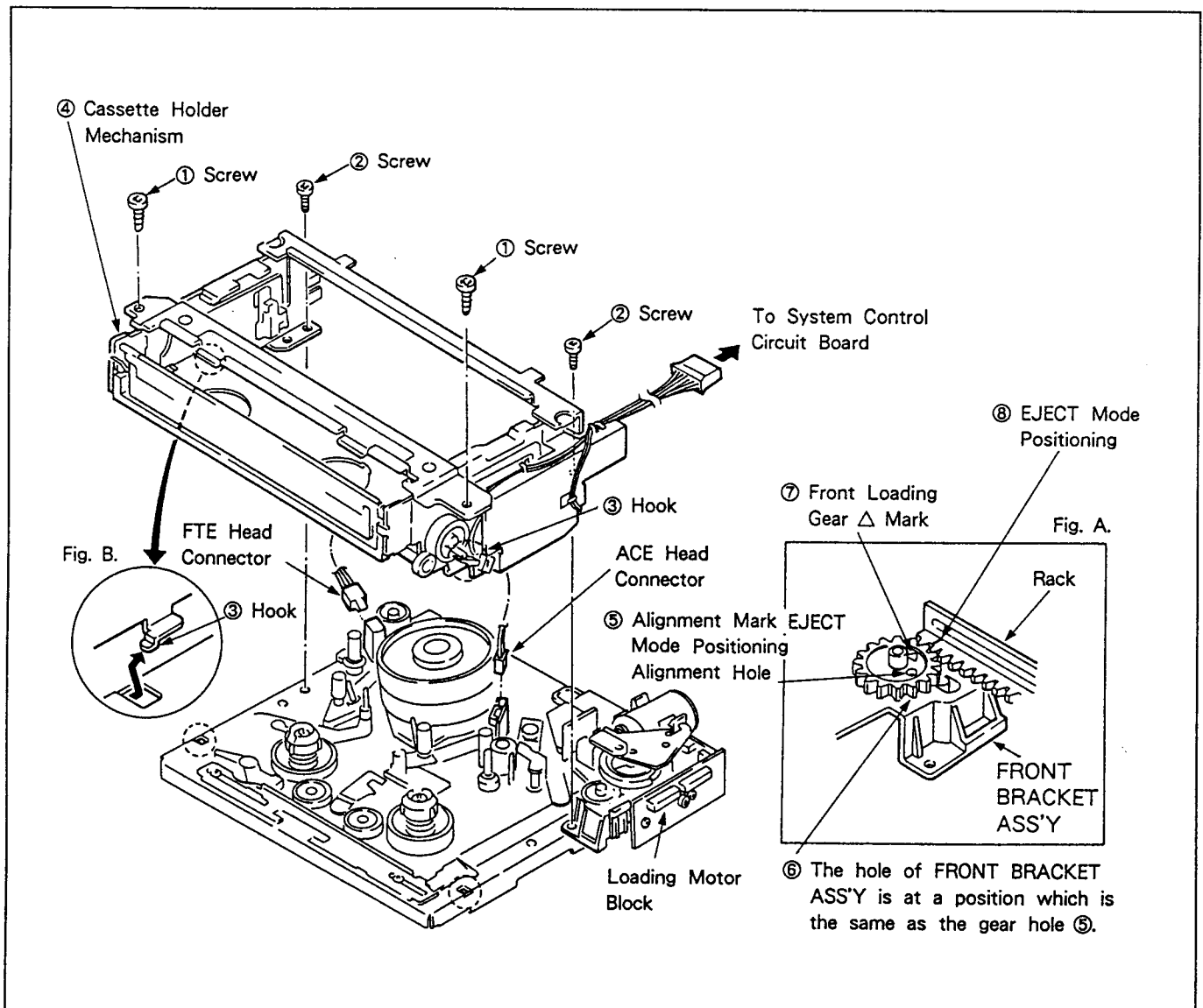


Fig. 2-2-1. Compl Cassette Mechanism

2-2.2. GEAR BRACKET ASS'Y (See Fig. 2-2-2.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ②.
- 3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

- 1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
- 2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
- 3) Apply grease to the toothed part of the RACK ⑦.
- 4) Fit the RACK ⑦ onto the two pins ⑨. Match position of the hole ⑪ to the GEAR BRACKET ASS'Y hole ⑫.
- 5) Mount the PINION GEAR ⑥, the PINION LEVER ASS'Y ⑤ and the LOCK GEAR ④ onto the axle ⑧, in that order.
Do it so that the PINION GEAR and LOCK GEAR HOLE ⑬ is aligned with the GEAR BRACKET ASS'Y hole ⑫.
- 6) Mount the E ring onto the axle ⑧.
- 7) Mount the GEAR BRACKET ASS'Y with the four screws ①, aligning it with the protuberance. When doing so, make sure that RACK and GEAR do not get misplaced with regard to each other. Also confirm that the FL START SWITCH ⑭ is ON.
- 8) Remount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

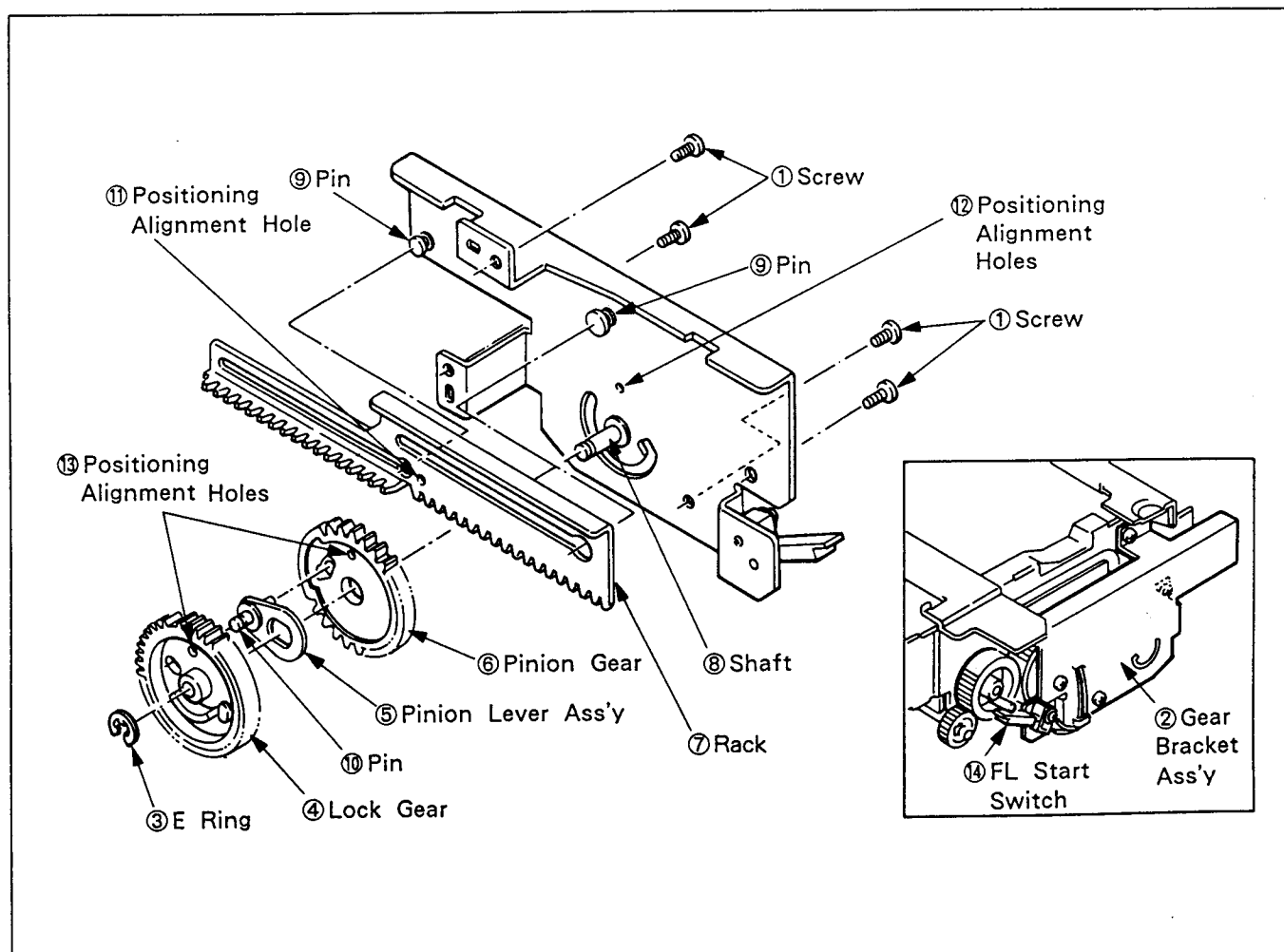


Fig. 2-2-2. Gear Bracket Ass'y

2-2-3. CASSETTE DRIVE GEAR (RIGHT)

(See Fig. 2-2-3.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in 2-2-1. and 2-2-2., respectively.
- 2) Remove the IDLER GEAR ①.
- 3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
- 4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.
- 5) Open the hook ⑥ and remove the COUPLE GEAR R ⑦. Take care not to open the hook ⑥ too much, otherwise it may get deformed or broken. If it does, replace it.
- 6) Remove the IDLER GEAR R ⑧.

2. Remounting

- 1) Apply grease to gear parts that undergo friction.
- 2) Mount the IDLER GEAR R ⑧ onto the axle ⑨.
- 3) Mount the COUPLE GEAR R ⑦ onto the ROD ASS'Y axle ⑩. When doing so, match the couple gear position with the IDLER GEAR R ⑧ as shown in Fig. A.
- 4) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Match position to the IDLER GEAR R ⑧ as shown in Fig. A.
- 5) Mount the E ring ④ onto the axle ⑫.
- 6) Mount the MAIN GEAR ③ onto the axle ⑬. When doing so, match position to the IDLER GEAR R ⑧ as shown in Fig. A.
- 7) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR R ③ and the LEVER GEAR ASS'Y R.
- 8) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, match position to the MAIN GEAR as shown in Fig. A.
- 9) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM ASS'Y as instructed in 2-2-2. and 2-2-1., respectively.

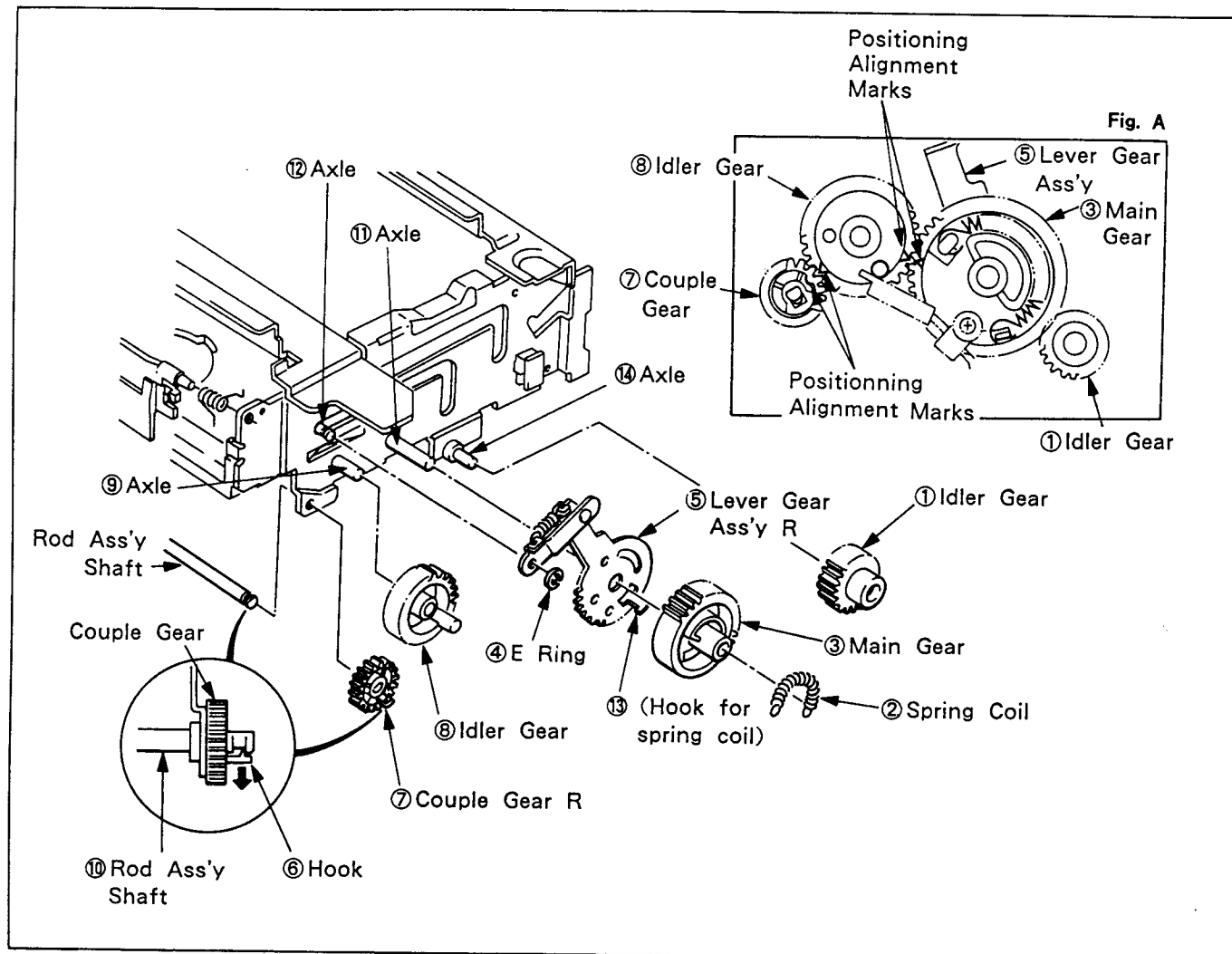


Fig. 2-2-3. Cassette Drive Gears (Right Side)

2-2-4. CASSETTE DRIVE GEAR (LEFT)

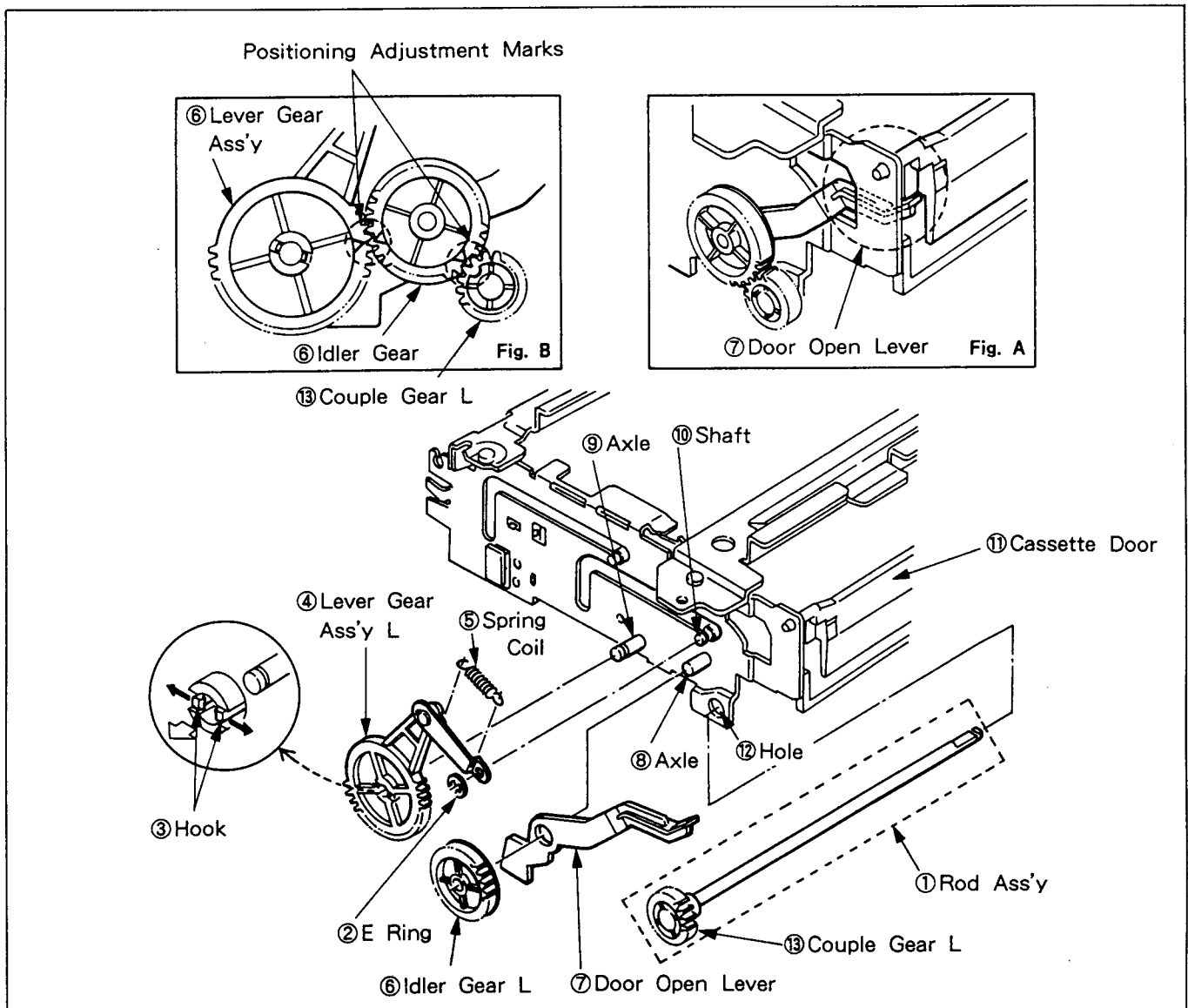
(See Fig. 2-2-4)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the COUPLE GEAR R as instructed in 2-2-3.
- 3) Remove the ROD ASS'Y ①.
- 4) Remove the E ring ②.
- 5) Remove the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
- 6) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y ④.
- 7) Remove the IDLER GEAR L ⑥ and the DOOR OPEN LEVER ⑦.

2. Remounting

- 1) Apply grease to the axles ⑧, ⑨ and ⑩.
- 2) Apply grease to the IDLER GEAR L ⑥.
- 3) Mount the DOOR OPEN LEVER ⑦ onto the axle ⑧. Do it so that the end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.
- 4) Mount the IDLER GEAR L ⑥ onto the axle ⑧.
- 5) Pass the ROD ASS'Y ① through the hole ⑫. Match position of the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig. B.
- 6) Mount the COUPLE GEAR R as instructed in 2-2-3.
- 7) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
- 8) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Match position to the IDLER GEAR L ⑥ as shown in Fig. B.
- 9) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in 2-2-1.



2-2-5. FL START SWITCH (See Fig. 2-2-5.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the screw ①.
- 3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

- 1) Solder the lead wire to the FL START SWITCH ② terminal.
- 2) Align the FL START SWITCH ② protuberance to the hole, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.
- 3) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

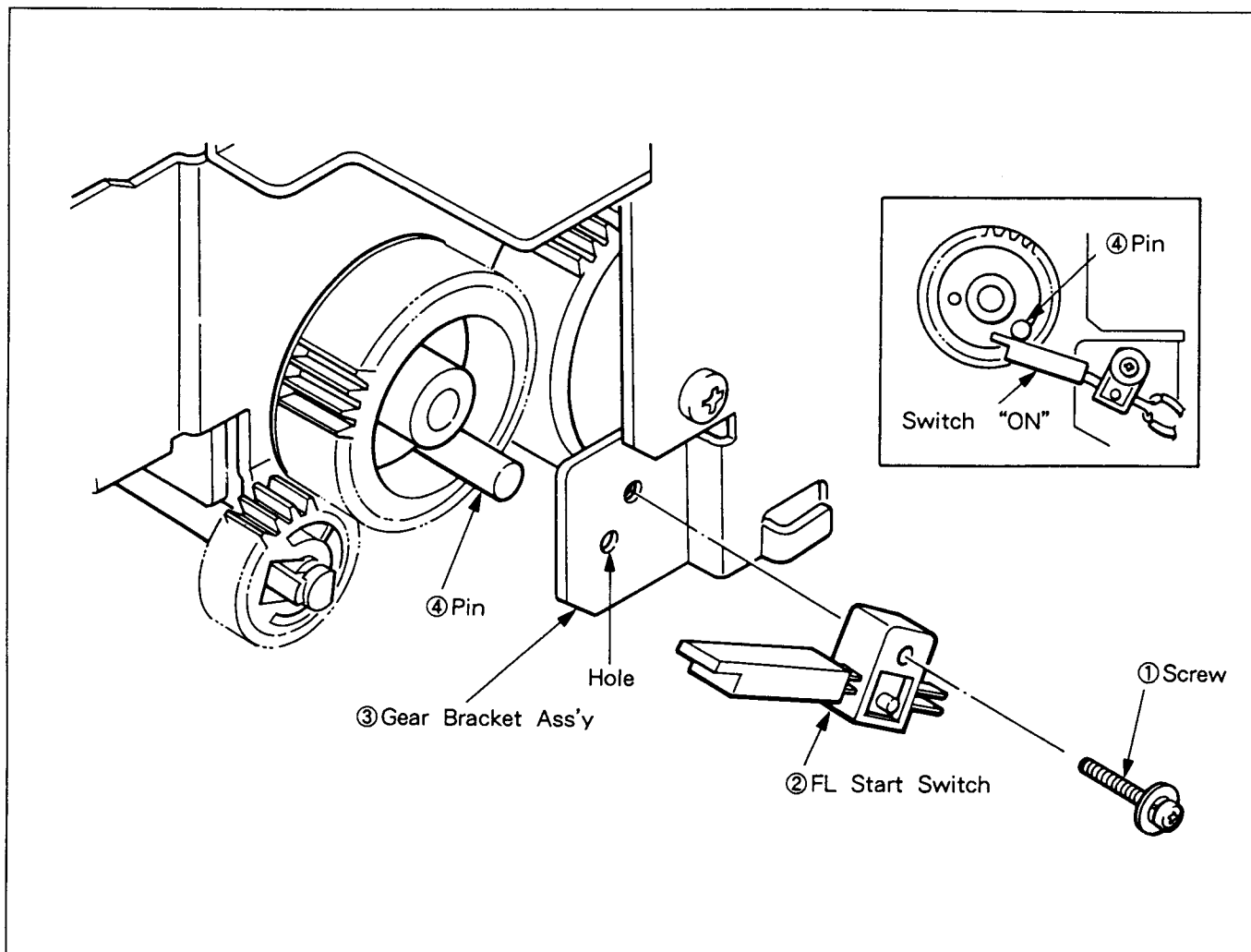


Fig. 2-2-5. FL Start Switch

2-2-6. T-TOP SENSOR, T-END SENSOR (See Fig. 2-2-6.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in 2-2-2.
- 3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
- 4) Remove the phototransistors ③, then remove the lead wires.

Note : Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

- 1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR phototransistor ③. Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR phototransistor.
- 2) Mount the phototransistors ③ onto their respective holders.
- 3) Mount the LID ② and fix it with the hook ①.
- 4) Mount the GEAR BRACKET ASS'Y as instructed in 2-2-2.
- 5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

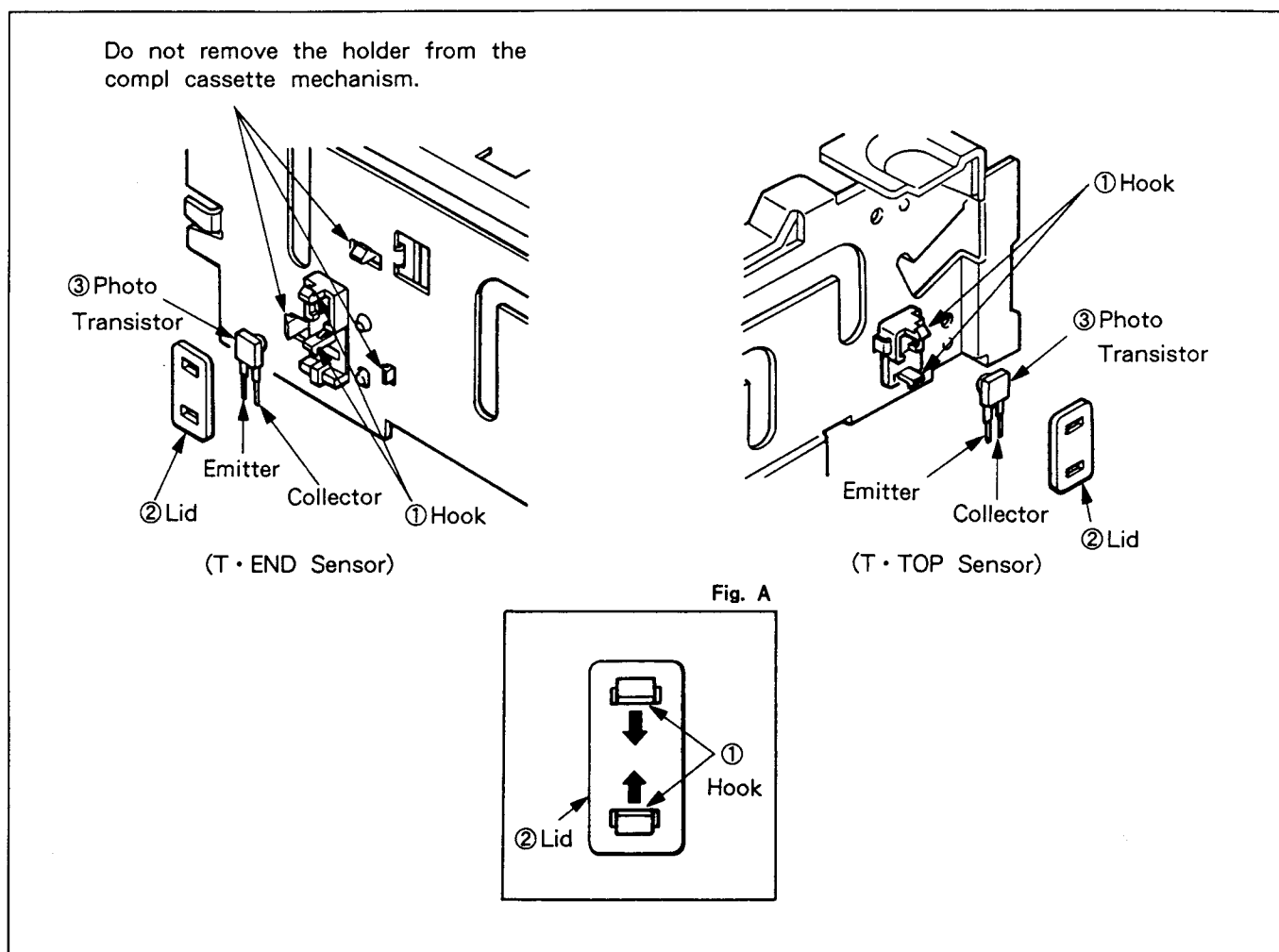


Fig. 2-2-6 T TOP Sensor & T END Sensor

2-3. COMPL MOTOR BRACKET (LOADING MOTOR BLOCK)

2-3-1. COMPL MOTOR BRACKET

1. Removal

- 1) Remove the COMPL VP-1 and the PRE-AMP. BRACKET as instructed in 2-1.
- 2) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 3) Remove the two screws ① and the other one ⑩, then remove the COMPL MOTOR BRACKET ② (see Fig. 2-3-1.).

2. Remounting

- 1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis positioning holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ positioning holes as shown in Fig. 2-3-2.
- 2) Set the COMPL MOTOR BRACKET to the INITIAL mode

with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR Δ mark ⑥ is aligned with the FRONT BRACKET ASS'Y initial position mark ⑦ (see Fig. 2-3-3.).

- 3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode position mark ⑨ (see Fig. 2-3-4.).
- 4) Line up LOADING MOTOR bracket ② with PROTUBERANCE ⑪ and POSITIONING HOLE ⑫, and attach with two screws ① and one screw ⑩. (Refer to Fig. 2-2-1.)
- 5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 6) Mount the COMPL VP-1 and the PRE-AMP. BRACKET as instructed in 2-1.

Note : Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.

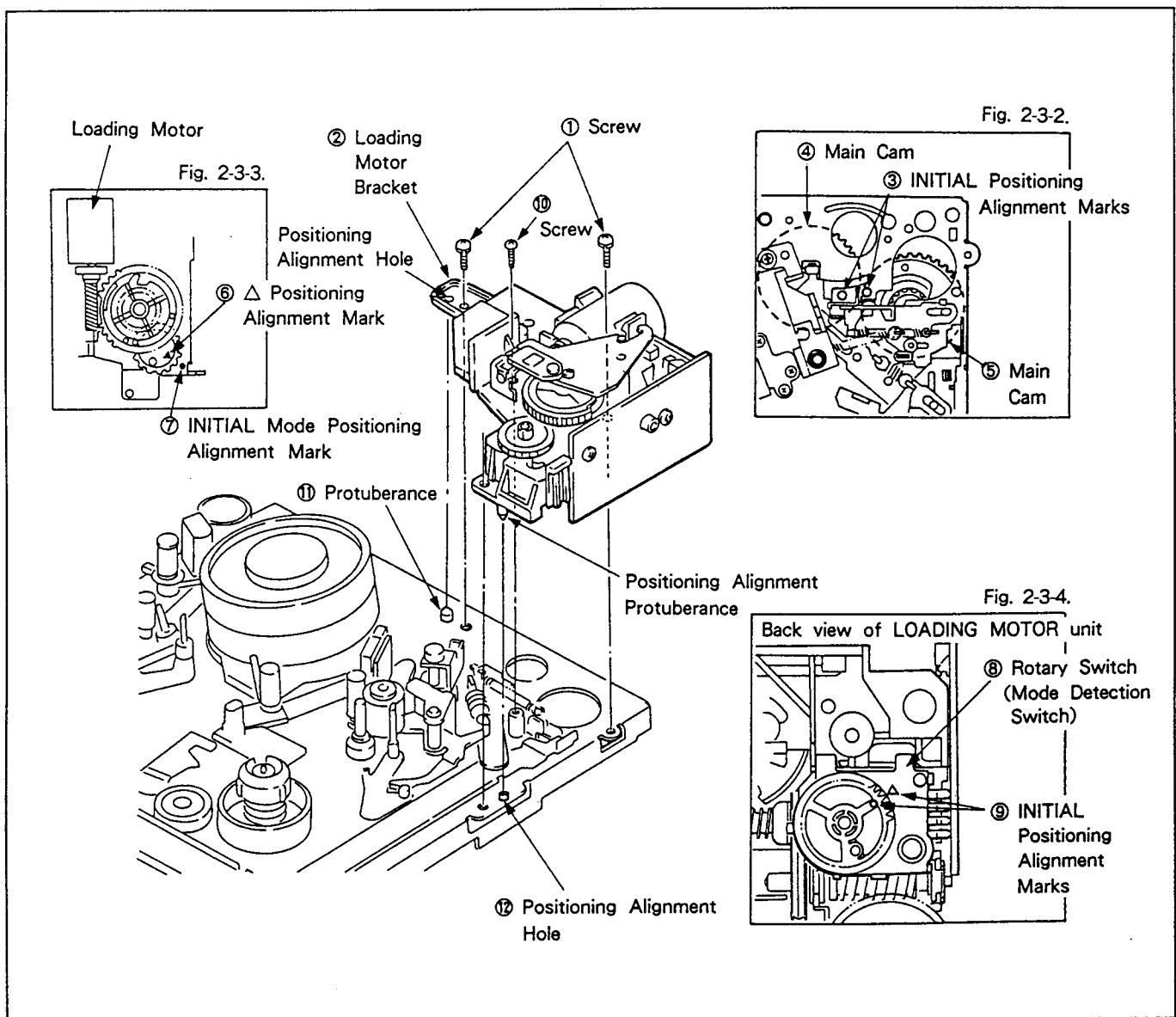


Fig. 2-3-1. Compl Motor Bracket

2-3-2. LOADING MOTOR (Refer to Fig. 2-3-5.)

1. Removal

LOADING MOTOR can be replaced after LOADING MOTOR BLOCK unit has been removed by referring to 2-3-1. The 1989 version of the mechanism allows LOADING MOTOR itself to be replaced without removing CASSETTE HOLDER BLOCK and LOADING MOTOR BLOCK. The following describes this procedure.

- 1) Use MODE SELECTOR (VHJ-0050) to set the mechanism to the initial mode.
- 2) Remove the connector for DEW SENSOR connected to the MC-3 board ①.
- 3) Remove three screws ② and remove HOLDER BRACKET ④ with FRONT WORM ASS'Y ③ still attached.
- 4) Remove DAMPER ⑥ attached to the pulley of LOADING MOTOR ⑤.
- 5) Remove FRONT HELICAL GEAR ⑦ and WASHER ⑧.
- 6) Remove soldered LEAD WIRE from the terminal of LOADING MOTOR ⑤.
- 7) Remove LOADING BELT ⑨.
- 8) Remove LOADING MOTOR ⑤ by lifting up from the back terminal side.

Note : The back terminal of LOADING MOTOR ⑤ is attached to MOTOR BRACKET ASS'Y ⑩ with glue.

2. Remounting

Before attaching LOADING MOTOR ⑤ to MOTOR BRACKET ASS'Y ⑩, confirm DAMPER ⑥ and DAMPER ⑫ shown in Fig. 2-3-5. are in the proper position on MOTOR BRACKET ASS'Y ⑩.

- 1) LOADING MOTOR ⑤ is mounted from the front pulley side by lining up ROD HOLE ⑬ and PROTUBERANCE ⑭ of MOTOR BRACKET ASS'Y ⑩.
- 2) Solder the lead wire from the MC-3 board to LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
- 3) Hang LOADING BELT ⑨ on the pulley.
- 4) After hanging BELT ⑨ on the pulley, confirm that the mechanism unit is in the initial mode. The initial mode is indicated by Fig. A of Fig. 2-3-5., and is the position in which INITIAL POSITIONING ALIGNMENT HOLES of MAIN CAM ⑮ and MODE CAM ⑯ are lined up with THROUGH HOLE ⑰ of MOTOR BRACKET ASS'Y. If the initial mode is not selected, adjust with MODE SELECTOR (VHJ-0050).
- 5) As shown in Fig. B, confirm the positions of the △ POSITIONING ALIGNMENT MARK on FRONT LOAD GEAR ⑱ and INITIAL MARK ⑲ position of MOTOR BRACKET ASS'Y and the position relationship of CASSETTE HOLDER RACK ⑳.
- 6) Apply a light coat of grease to the entire sides of AXLE ㉑ and FRONT HELICAL GEAR ⑦.
- 7) Attach FRONT HELICAL GEAR ⑦ and WASHER ⑧ to AXLE ㉑. As shown in Fig. C, FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of FRONT LEVER ASS'Y.
- 8) Attach DAMPER ⑥ to LOADING MOTOR ⑤ pulley.
- 9) HOLDER BRACKET ④ is attached by engaging FRONT WORM ASS'Y ③ with LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
- 10) Attach the connector of DEW SENSOR to the MC-3 board and return the mechanism to the eject completion using MODE SELECTOR.

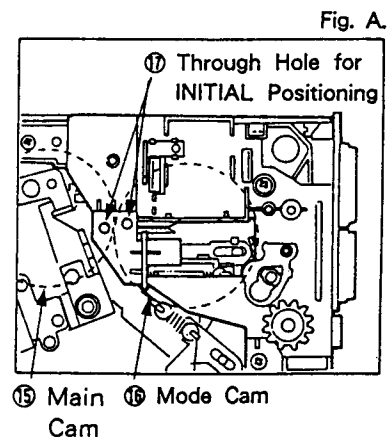
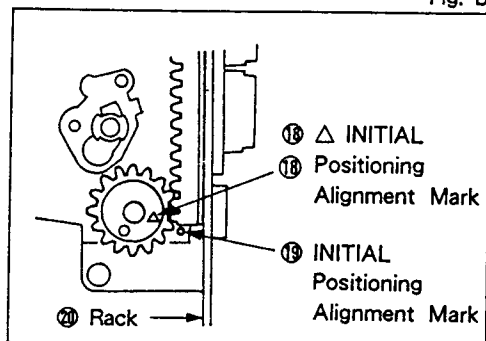
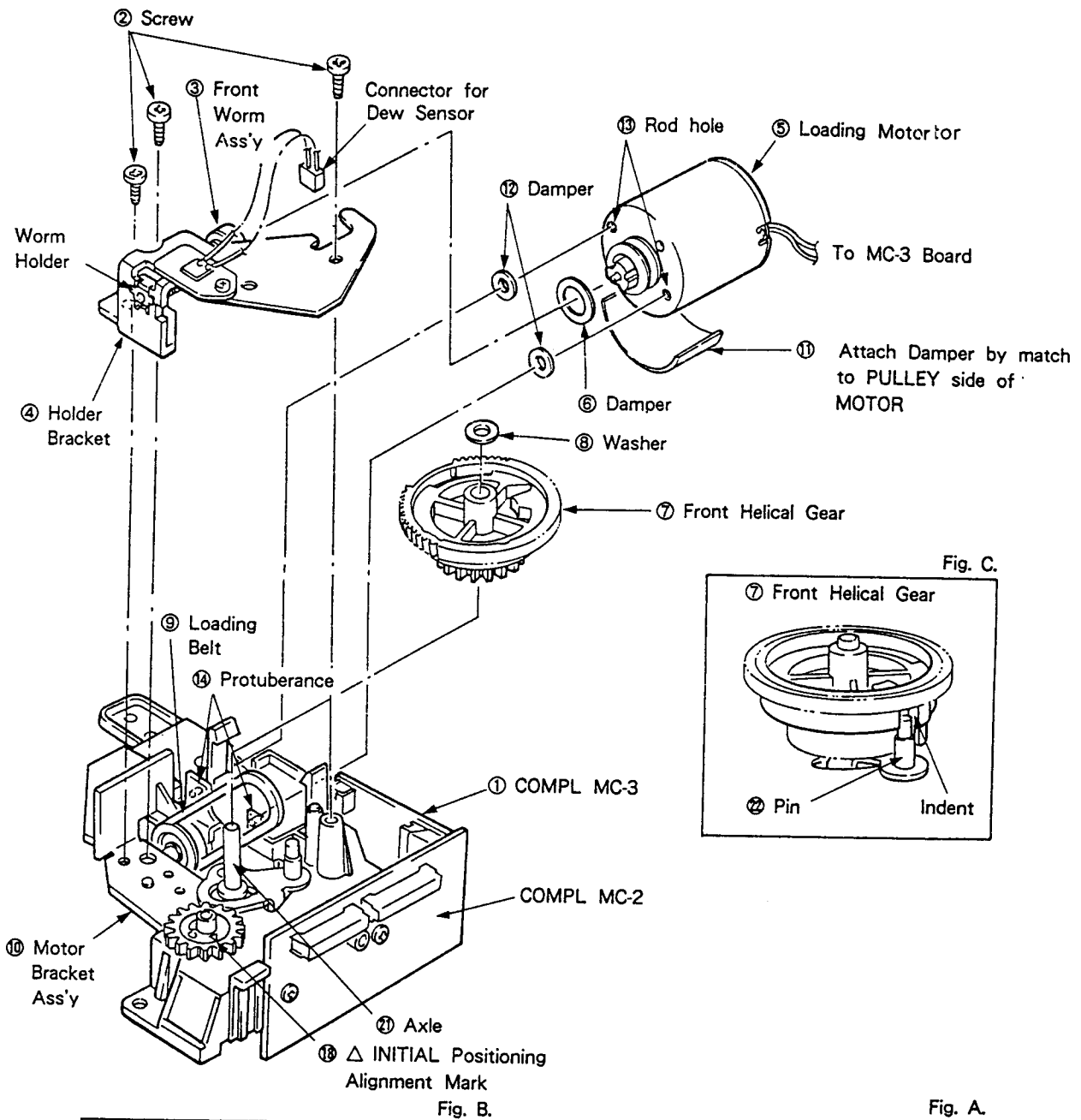


Fig. 2-3-5. Loading Motor

2.4. TAPE LOADING MECHANISM

2.4.1. MAIN PARTS OF THE TAPE LOADING MECHANISM (See Fig. 2-4-1.)

1. Removal

- 1) Remove connectors from the DRUM MOTOR board (SV-5).
- 2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
- 3) Remove the two special washers ③, then remove the LOAD RACK ④.
- 4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
- 5) Remove the stop washer ⑦, then remove the MAIN CAM ⑧.
- 6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
- 7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL S ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note: Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

- 1) Apply grease to the hole ⑰ of the LOAD LEVER ASS'Y S ⑯, as shown in Fig. B.
- 2) Apply grease to the hole ⑱ of the LOAD LEVER ASS'Y T ⑫ as shown in Fig. A, and to the sections of the LOAD GEAR T ⑨ as indicated with an arrow in Fig. C.
- 3) Apply grease to 1 and 2 and to the outer side of the MAIN CAM ⑧, shown in Fig. E.
- 4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
- 5) Apply grease to the outer surface of axles ⑲, ⑳, ㉑ and ㉒.
- 6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑳ into the LOAD LEVER ASS'Y S hole ⑰.
- 7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ㉑. When doing so, set the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position ㉒. Insert the ROLLER BASE T pin ㉓ into the hole ㉔ of the LOAD LEVER ASS'Y T ⑫.
- 8) Set the MAIN CAM ⑧ to the INITIAL mode position ㉕ with the MODE CAM ㉖, and mount onto the axle ㉗. Confirm that the CAM PINCH LEVER ASS'Y pin ㉘ gets into the MAIN CAM GROOVE 1 as shown in Fig. E.
- 9) Mount the special washer ⑦ to the axle ㉗.
- 10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉗. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
- 11) Mount the special washer ⑤ onto the axle ㉗.
- 12) Set the LOAD RACK ④ to the INITIAL mode position ㉚ with the LOAD GEAR T ⑨, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉜ into the hole ㉔.
- 13) Mount the two special washers ③ onto the two axles ㉛.
- 14) Mount the REINFORCE BRACKET ② with the three screws ①.
- 15) Insert the connector into the DRUM MOTOR board (SV-5).
- 16) Confirm that loading and unloading are performed smoothly.

Note: Be sure to perform INITIAL mode positioning of cams and gears precisely.

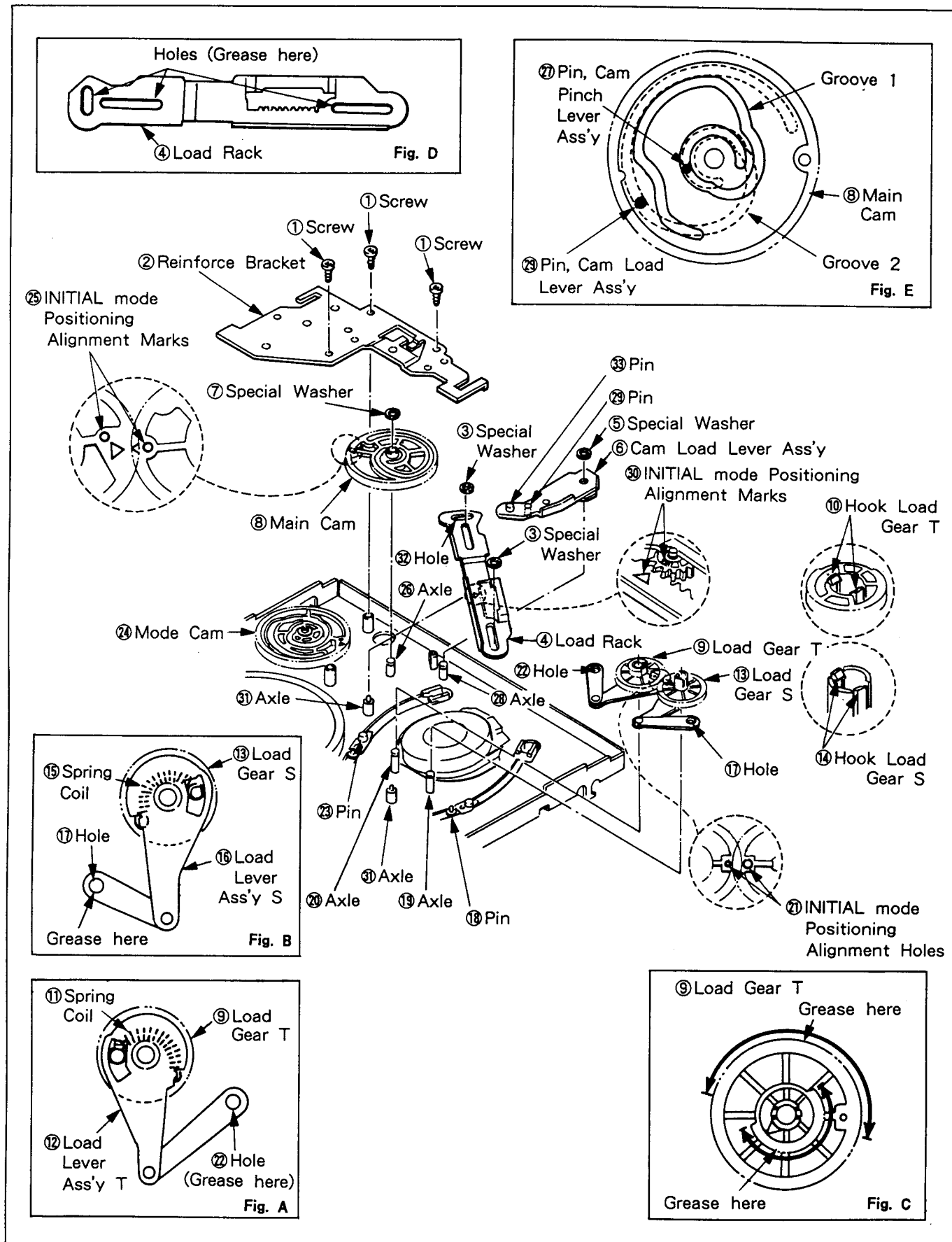


Fig. 2-4-1. Loading Mechanism Main Parts

2-4-2. MODE CAM (See Fig. 2-4-2.)

1. Removal

- 1) Set the INITIAL mode with the mode selector (VHJ-0050).
- 2) Remove the REINFORCE BRACKET as instructed in 2-4-1.
- 3) Remove the two stop washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
- 4) Remove the MODE CAM ③.

2. Remounting

- 1) Referring to 2-4-1., confirm that the MAIN CAM is in the INITIAL mode position.
- 2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (refer to 2-4-1. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
- 3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode position mark ⑤ as shown in Fig. A.
- 4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
- 5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point ⑨ of the bent-up part into the ACT PLATE SLIDE ASS'Y hole ⑩.
- 6) Mount the two special washers ① onto the axles ⑥ and ⑦.
- 7) Mount the REINFORCE BRACKET as instructed in 2-4-1.

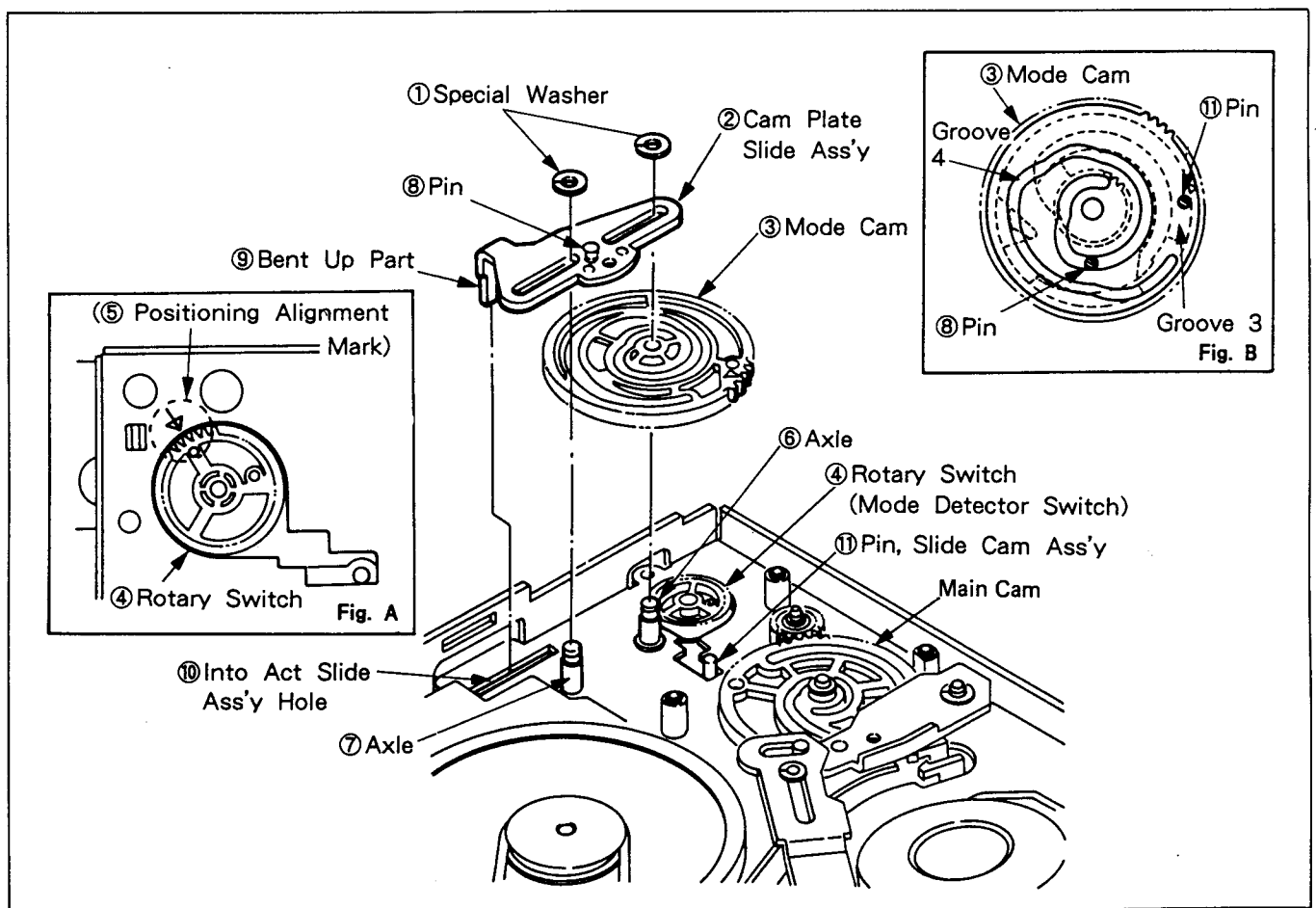


Fig. 2-4-2. Mode Cam

2.5. COMPL HEAD BRACKET (ACE HEAD) (See Fig. 2-5-1.)

1. Removal

- 1) Remove the COMPL HEAD BRACKET special mounting nut ②.
- 2) Remove the SPACER ③, the COMPL HEAD BRACKET ① and the ACE HEAD SPRING COIL ④, in that order.

Note: Take care not to scratch or soil the ACE head surface.

2. Remounting

- 1) Apply grease to the axle ⑥ as shown in Fig. A.
- 2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦.
- 3) Mount the ACE HEAD SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the ACE HEAD SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦ (See Fig. A).
- 4) Mount the SPECIAL NUT ② onto the axle ⑥ through the SPACER ③.
- 5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
- 6) Perform ACE head adjustment as instructed in 5-4.

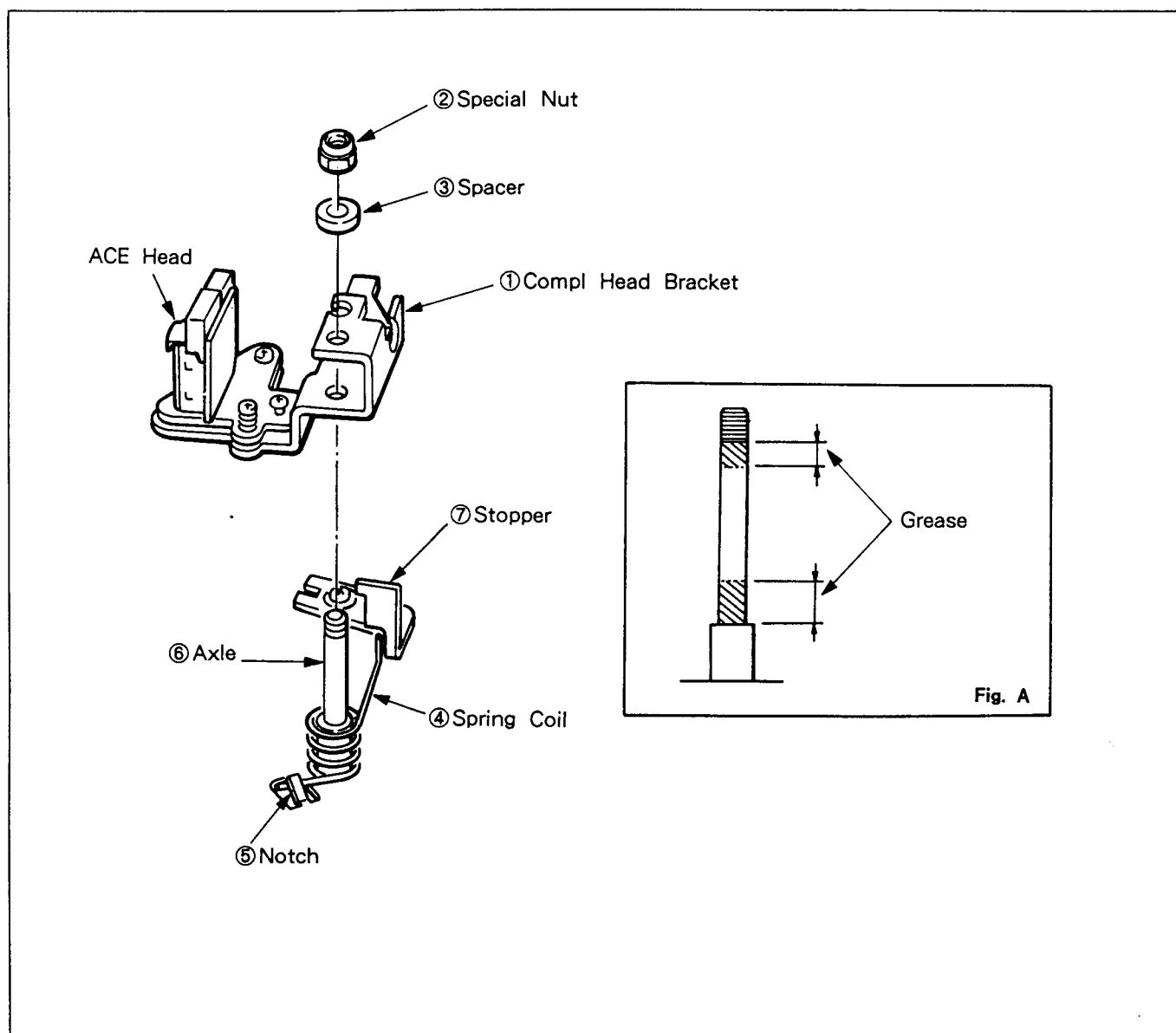


Fig. 2-5-1. Compl Head Bracket (ACE Head)

2-6. PINCH ROLLER PRESSURE MECHANISM (See Fig. 2-6-1.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the COMPL HEAD BRACKET as instructed in 2-5.
- 3) Remove the PINCH SPRING COIL ①.
- 4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
- 5) Remove the REV GUIDE LEVER SPRING COIL ④.
- 6) Remove the REV GUIDE LEVER ASS'Y ⑥ from the plastic molding bearing hook ⑤ at the bottom. Take care not to open the hook too much, otherwise it may be deformed or broken.
- 7) Remove the LINK LOCK SPRING COIL ⑦.
- 8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
- 9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

2. Remounting

- 1) Apply grease to pins ⑫/⑬ and axles ⑮/⑯.
- 2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
- 3) Set the INITIAL mode with the mode selector (VHJ-0050).

- 4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
- 5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑮ while inserting the pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑱.
- 6) Mount the special washer ⑧ onto the axle ⑮.
- 7) Hook the LINK LOCK SPRING COIL ⑦ to the PINCH CAM LEVER ASS'Y ⑨.
- 8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
- 9) Hook the REV GUIDE LEVER SPRING COIL ④.
- 10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑮.
- 11) Mount the special washer ② to the axle ⑮.
- 12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
- 13) Mount the COMPL HEAD BRACKET as instructed in 2-5.
- 14) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 15) Perform ACE head adjustment as instructed in 5-4.

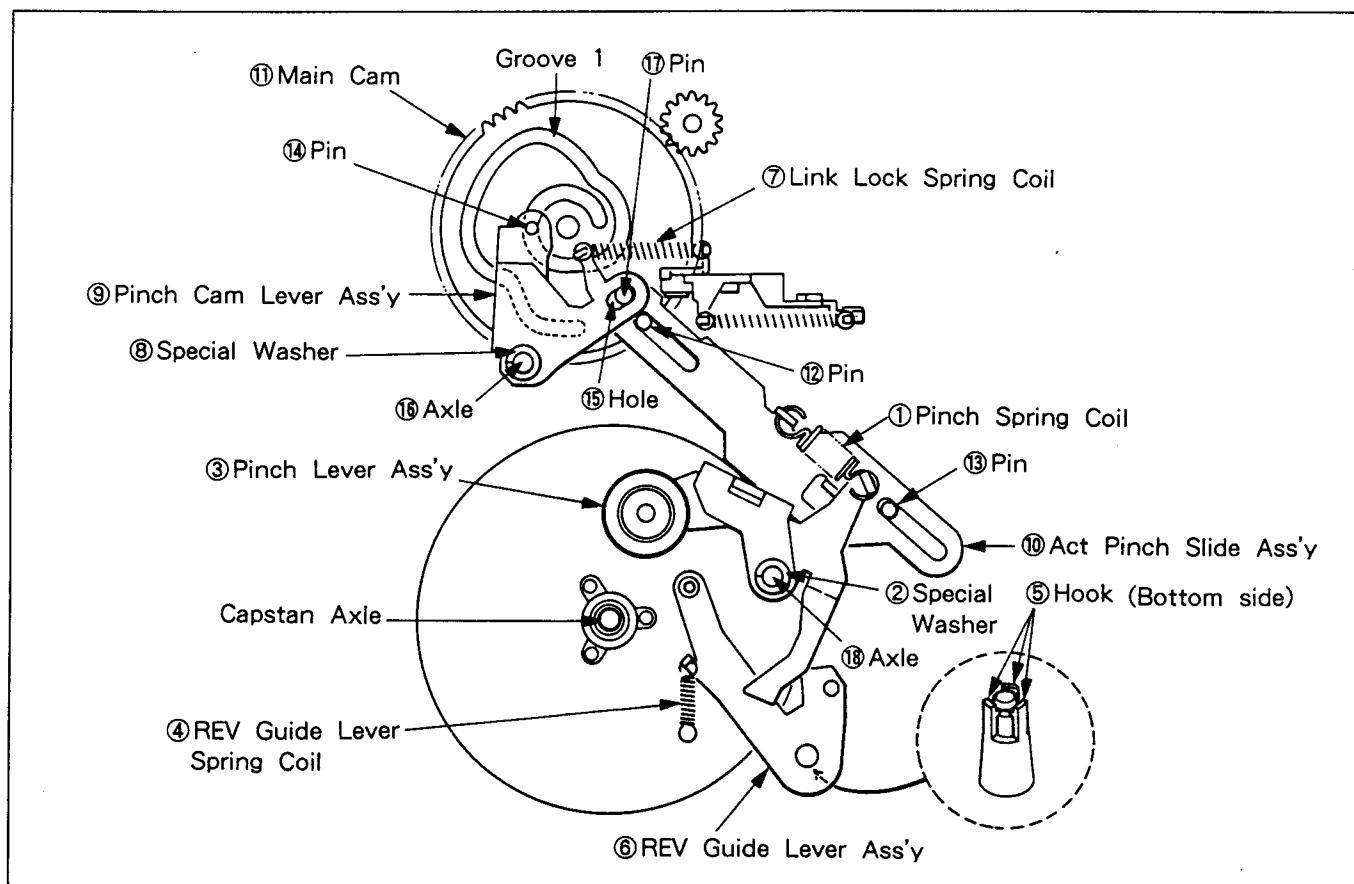


Fig. 2-6-1. Pinch Roller Pressure Mechanism

2-7. BRAKE MECHANISM

2-7-1. SUB TAKE-UP BRAKE ASS'Y

(See Fig. 2-7-1.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the SPRING COIL ①.
- 3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

- 1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
- 2) Fit the SPRING COIL between hooks ⑤ and ⑥.
- 3) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

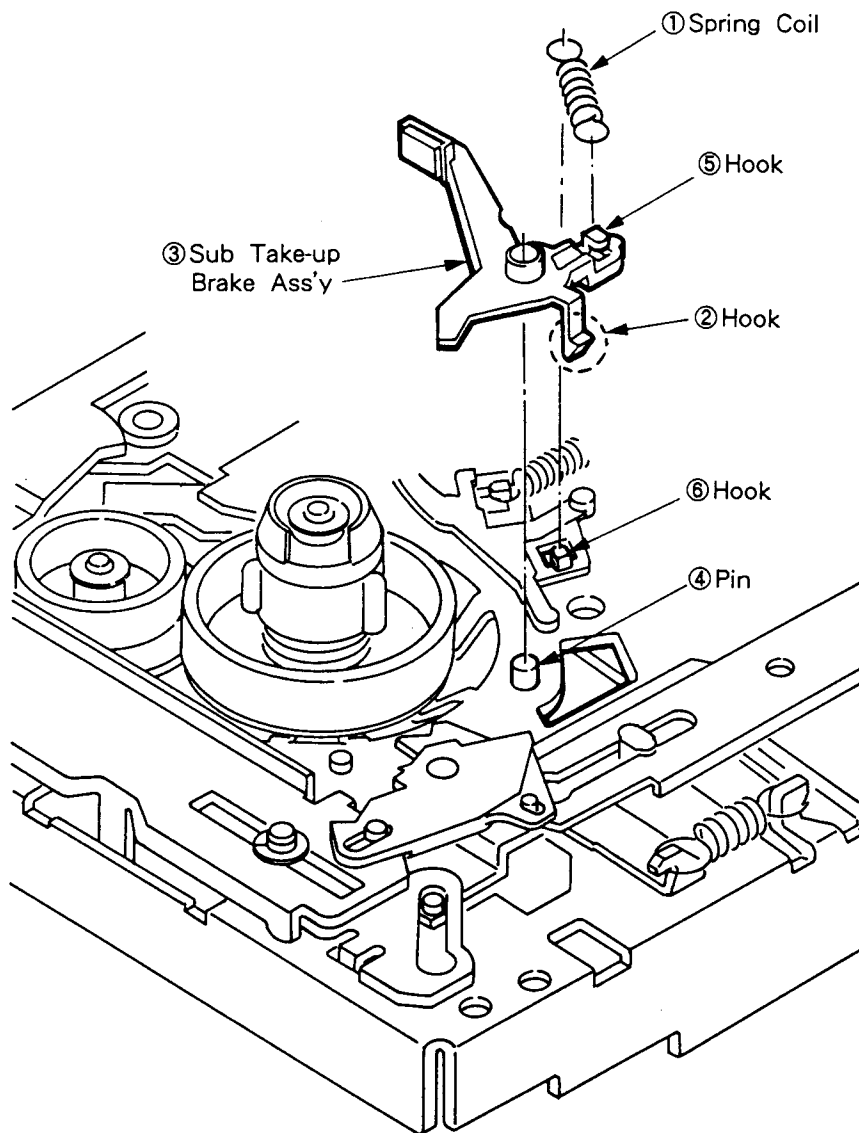


Fig. 2-7-1. Sub Take-up Brake Ass'y

2-7-2. SUPPLY BRAKE ASS'Y AND TAKE-UP BRAKE ASS'Y (See Fig. 2-7-2.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the SUB TAKE-UP BRAKE as instructed in 2-7-1.
- 3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
- 4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
- 5) Remove the SPRING COIL ⑤.
- 6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note: Take care not to soil the brake shoes.

2. Remounting

- 1) Apply a thin layer of grease to axles ⑧ and ⑨.
- 2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
- 3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
- 4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
- 5) Mount the two special washers ③ onto the two pins ⑩.
- 6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the ACT PLATE SLIDE ASS'Y pin ⑫ into the hole ⑬, and the M PLATE SLIDE ASS'Y pin ⑬ into the hole ⑭.
- 7) Mount the special washer ① onto the pin ⑫.
- 8) Mount the SUB TAKE-UP BRAKE as instructed in 2-7-1.
- 9) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

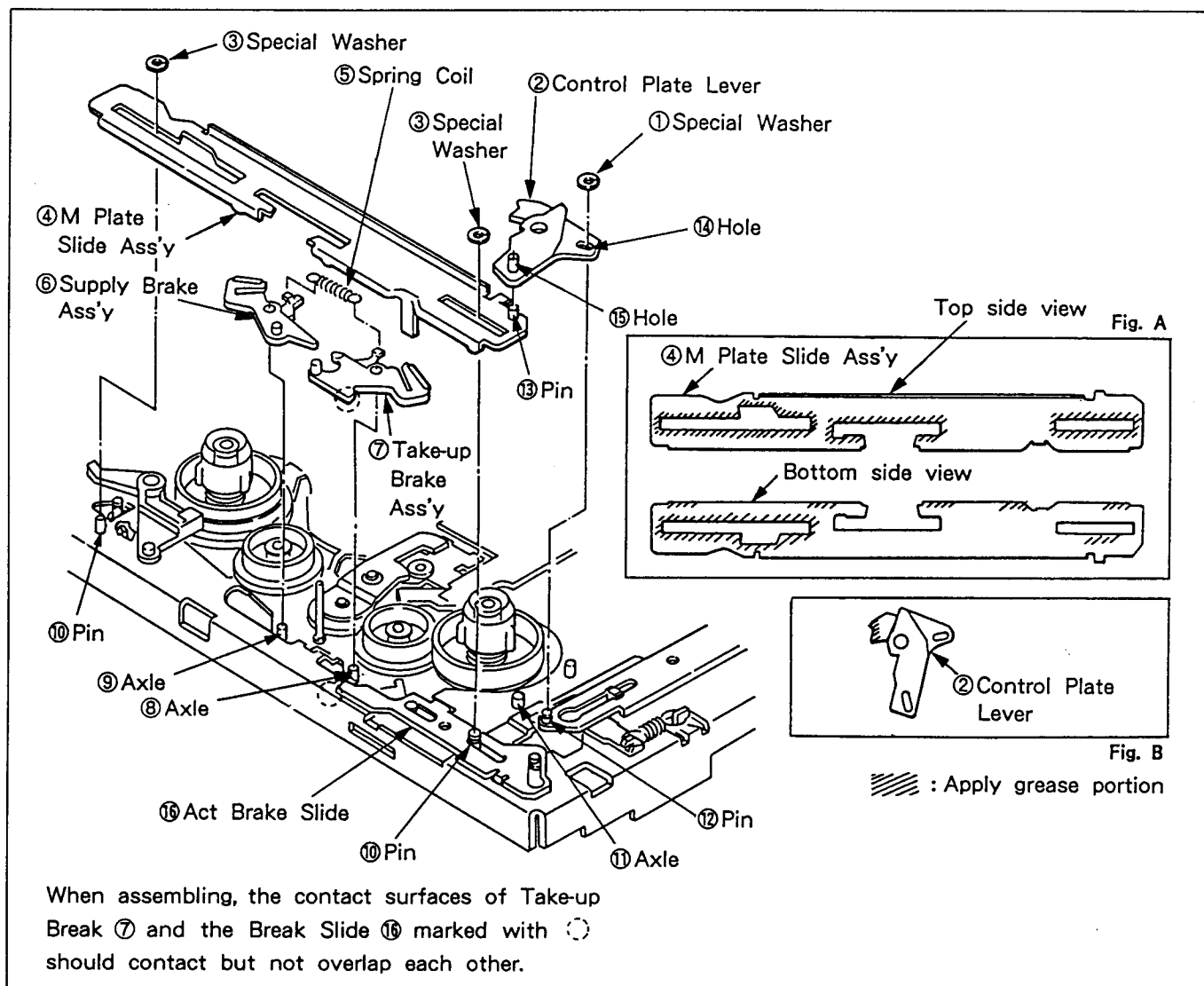


Fig. 2-7-2. Supply Brake Ass'y & Take-up Brake Ass'y

2-7-3. TENSION LEVER ASS'Y AND BAND HOLDER ASS'Y (See Fig. 2-7-3.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the SPRING COIL ①.
- 3) Remove the screw ③ fixing the BAND HOLDER ASS'Y ②.
- 4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow, setting the BAND HOLDER ASS'Y ② free.
- 5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
- 6) Remove the hook ⑦ of the BAND HOLDER ASS'Y.

2. Remounting

- 1) Mount the BAND HOLDER ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧.
- 2) Insert the TENSION LEVER ASS'Y axle ⑨ into the hole ⑩ and confirm that the hook ⑤ is hooked.
- 3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow, mount the BAND HOLDER ASS'Y ② with the screw ③.
- 4) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
- 5) Perform TENSION POLE position adjustment as instructed in 5-3.
- 6) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

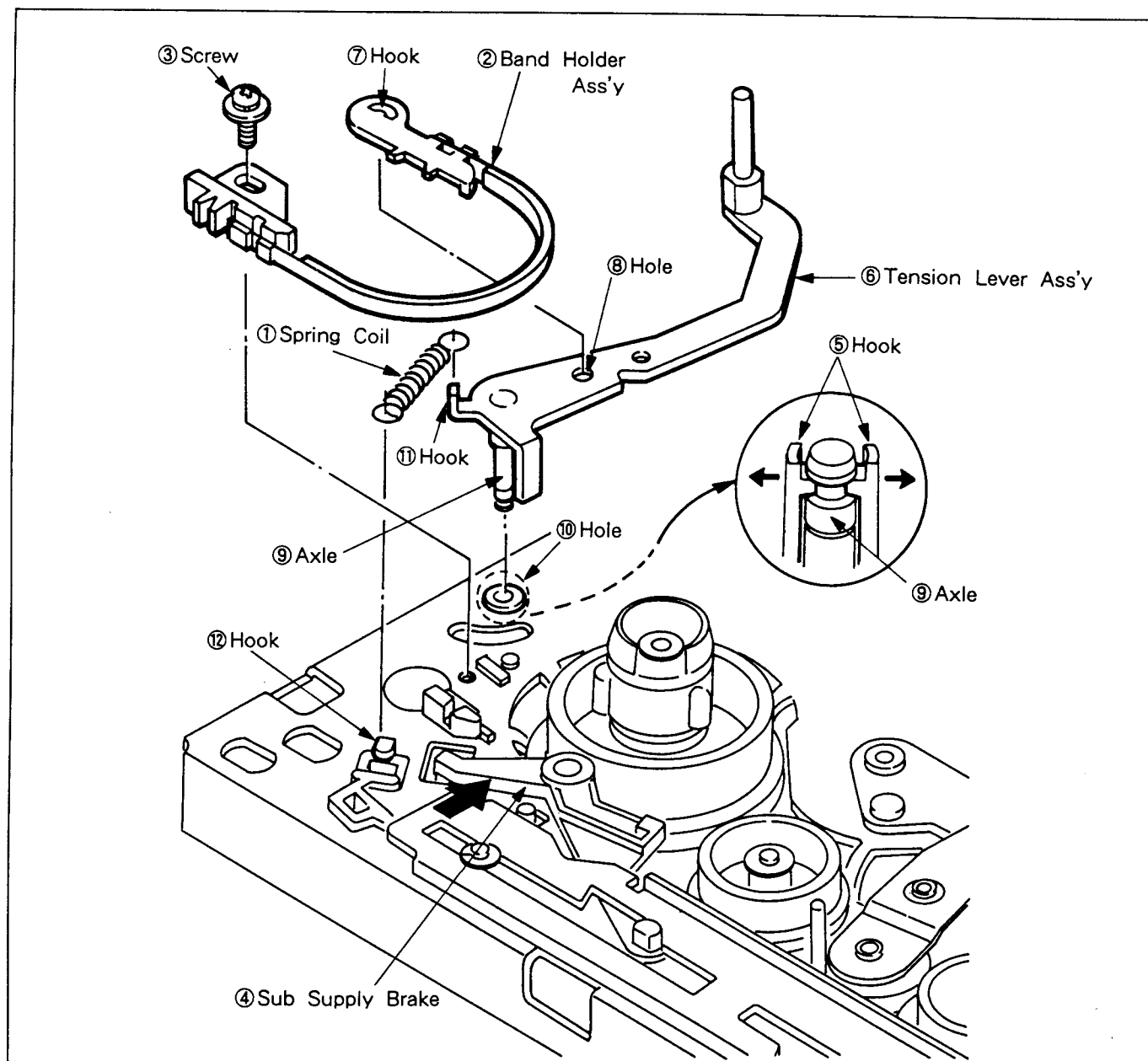


Fig. 2-7-3. Tension Lever Ass'y & Band Holder Ass'y

2-7-4. CAPSTAN BRAKE ASS'Y (See Fig. 2-7-4.)

1. Removal

- 1) Remove the SPRING COIL ①.
- 2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting

- 1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
- 2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

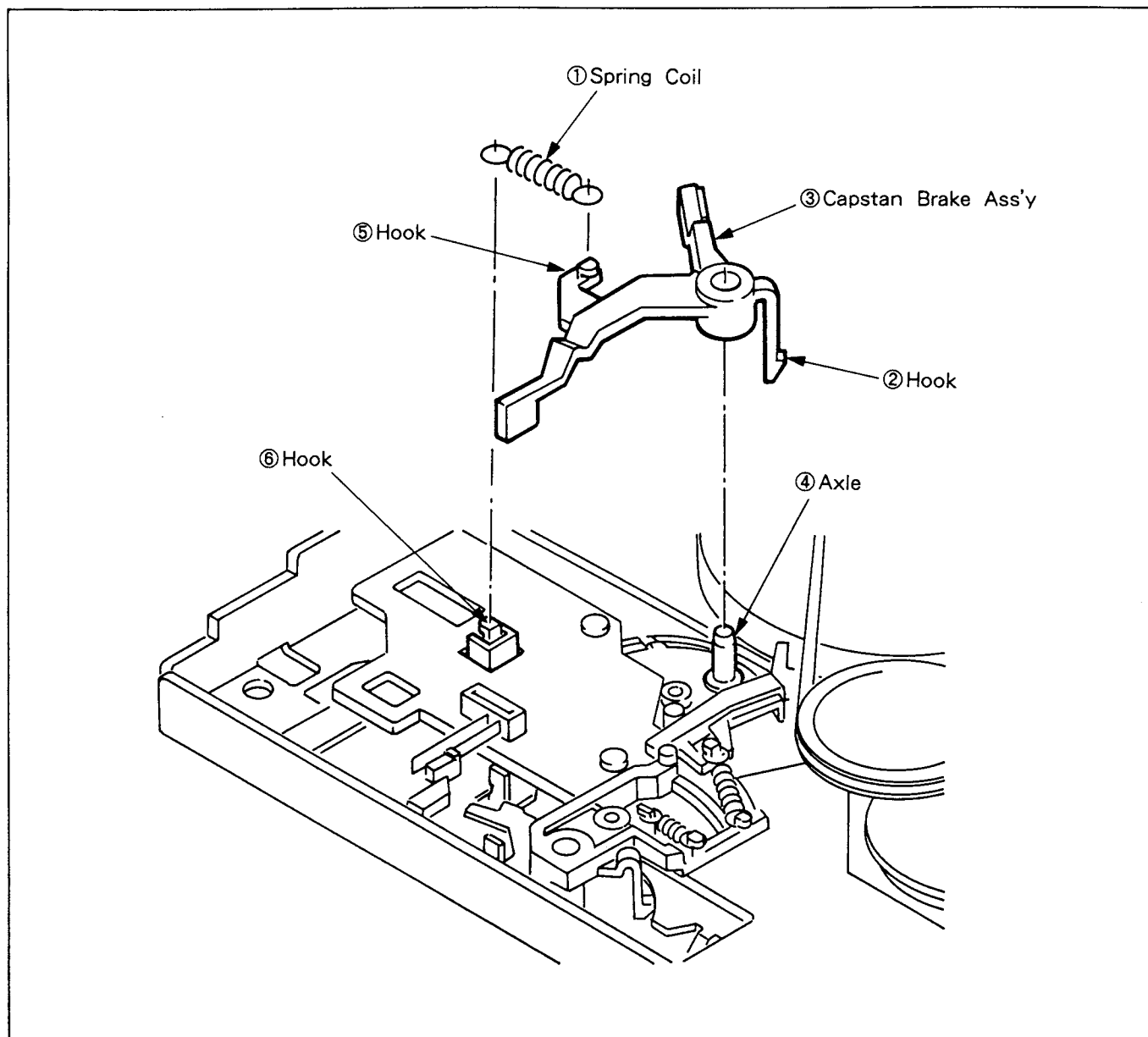


Fig. 2-7-4. Capstan Brake Ass'y

2-8. REEL TABLE DRIVE MECHANISM

2-8-1. SUPPLY REEL ASS'Y AND SUPPLY REEL GEAR (See Fig. 2-8-1.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the BAND HOLDER ASS'Y as instructed in 2-7-3.
- 3) Set the PLAY mode with the mode selector (VHJ-0050).
- 4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
- 5) Remove the special washer ④.
- 6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

- 1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
- 2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
- 3) Mount the special washer ④ to the axle ⑧.
- 4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
- 5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
- 6) Perform reel table height adjustment as instructed in 5-2-1.
- 7) Mount the special washer ① onto the axle ⑨.
- 8) Mount the BAND HOLDER ASS'Y as instructed in 2-7-3.
- 9) Perform tension pole position adjustment as instructed in 5-3.
- 10) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

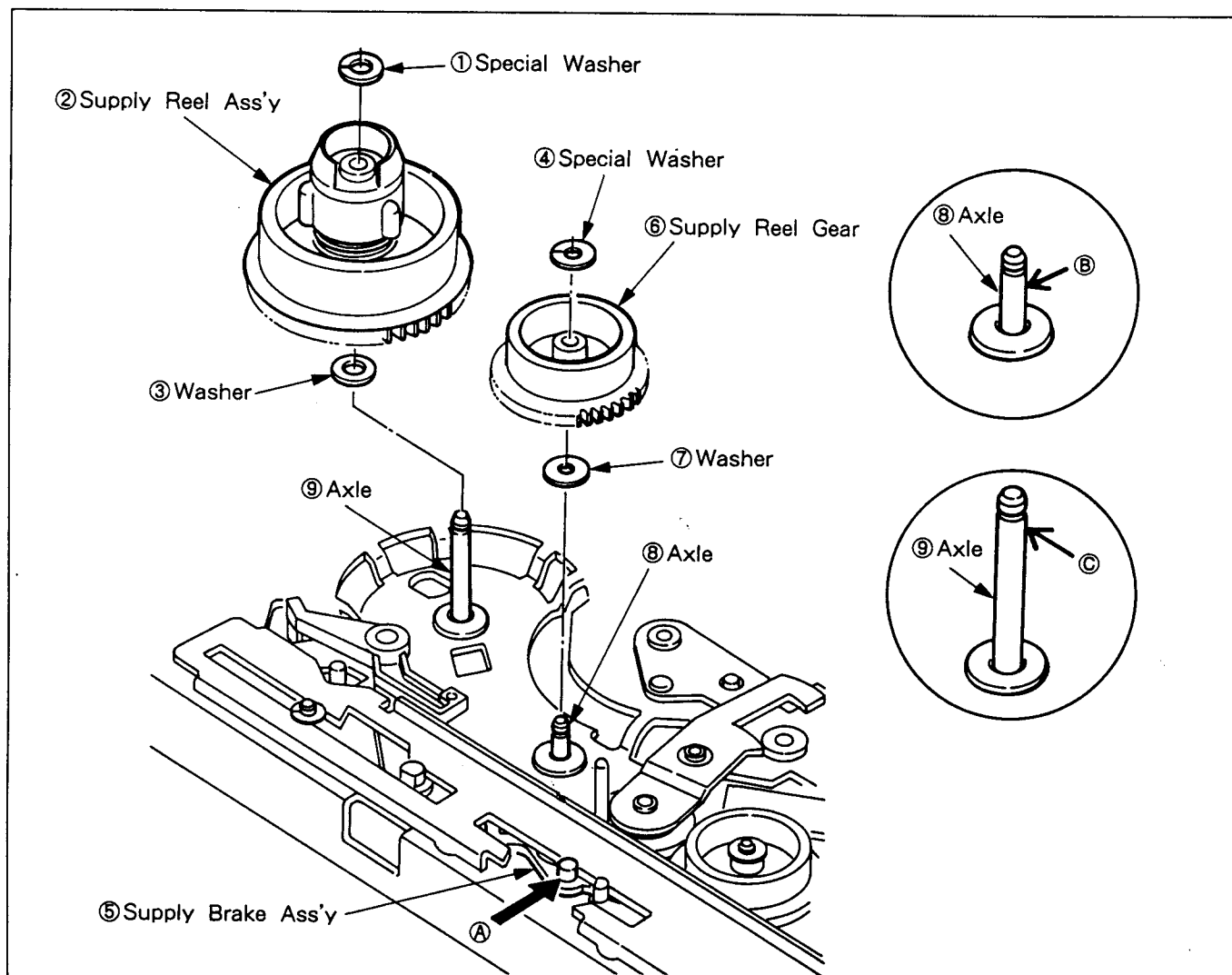


Fig. 2-8-1. Supply Reel Ass'y & Supply Reel Gear

2-8-2. TAKE-UP REEL ASS'Y (See Fig. 2-8-2.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the special washer ①.
- 3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note : Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

- 1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
- 2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
- 3) Perform reel table height adjustment as instructed in 5-2.
- 4) Mount the special washer ① onto the axle ⑤.
- 5) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

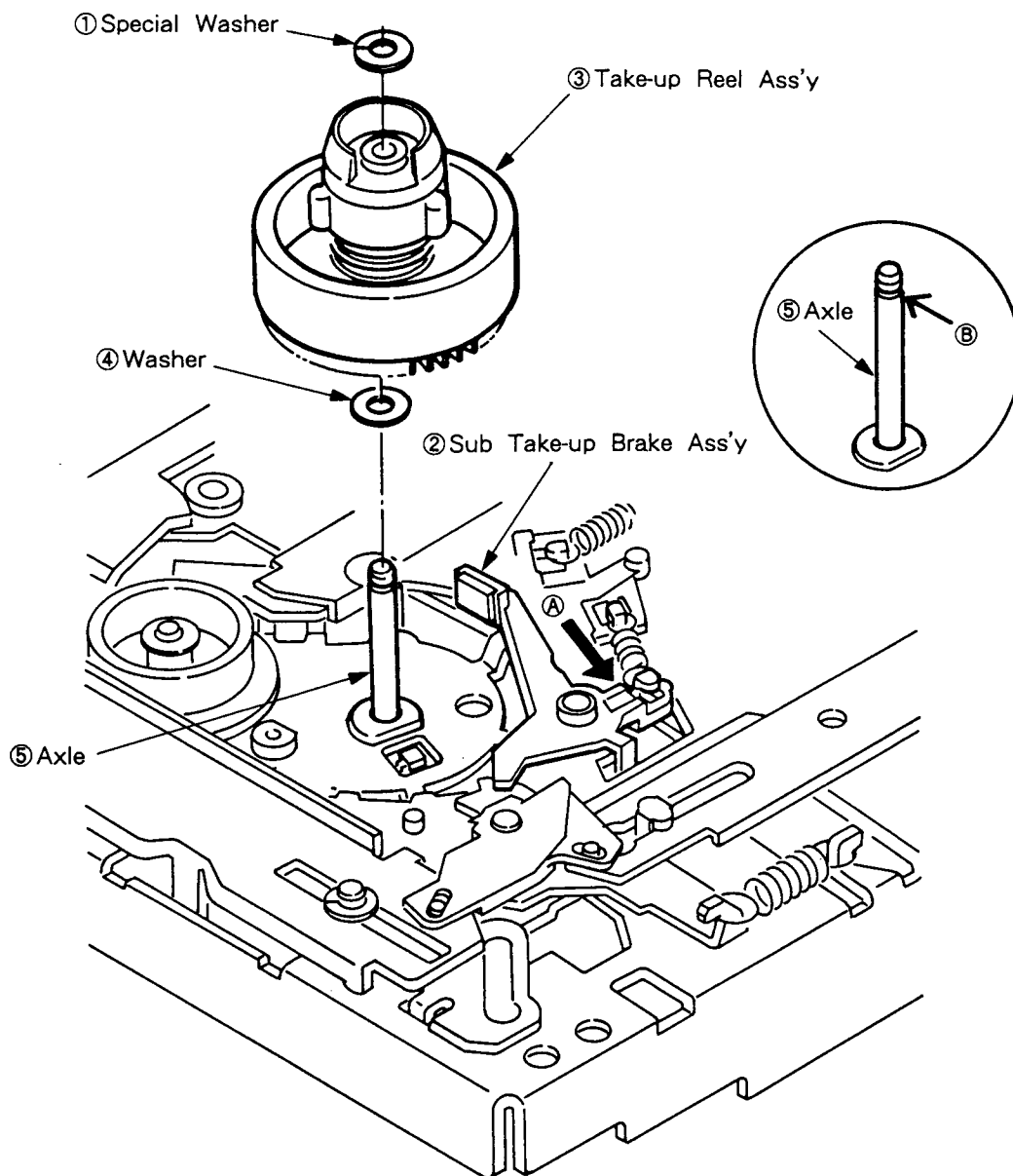


Fig. 2-8-2. Take-up Reel Ass'y

2-8-3. TAKE-UP REEL GEAR (See Fig. 2-8-3.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the TAKE-UP REEL ASS'Y as instructed in 2-8-2.
- 3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in 2-7-1.
- 4) Remove the TAKE-UP BRAKE ASS'Y as instructed in 2-7-2.
- 5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

- 1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
- 2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
- 3) Mount the special washer ① onto the axle ⑤.
- 4) Mount the TAKE-UP BRAKE ASS'Y as instructed in 2-7-2.
- 5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in 2-7-1.
- 6) Mount the TAKE-UP REEL ASS'Y as instructed in 2-8-2.
- 7) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

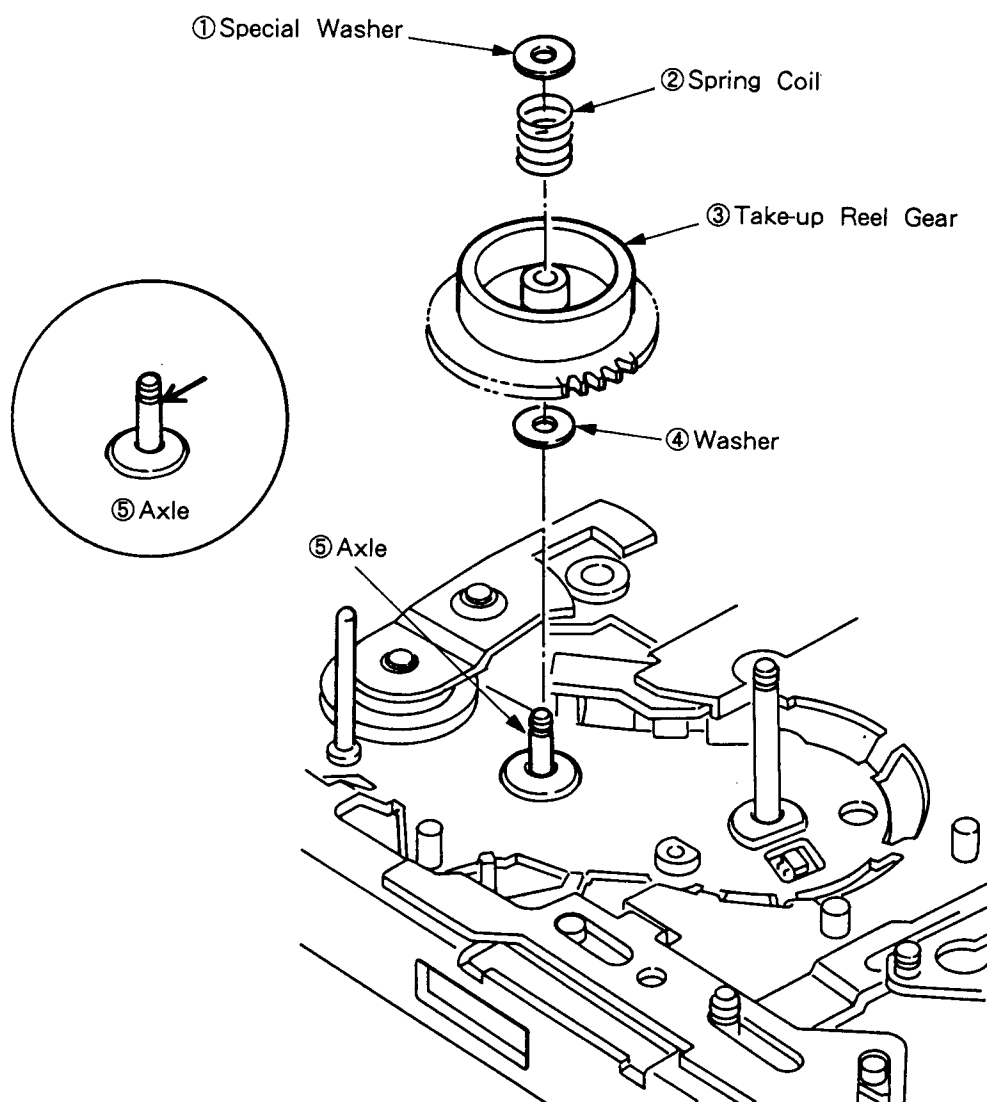


Fig. 2-8-3. Take-up Reel Gear

2-8-4. REEL PULLEY AND FRICTION GEAR ASS'Y (See Fig. 2-8-4.)

1. Removal

- 1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
- 2) Remove the REEL DRIVE BELT ③.
- 3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
- 4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

2. Remounting

- 1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with arrows.
- 2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
- 3) Mount the special washer ⑥ onto the axle ⑨.
- 4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
- 5) Mount the special washer ④ onto the axle ⑩.
- 6) Set the REEL DRIVE BELT ③.
- 7) Mount the PULLEY BRACKET ② with the two screws ①.

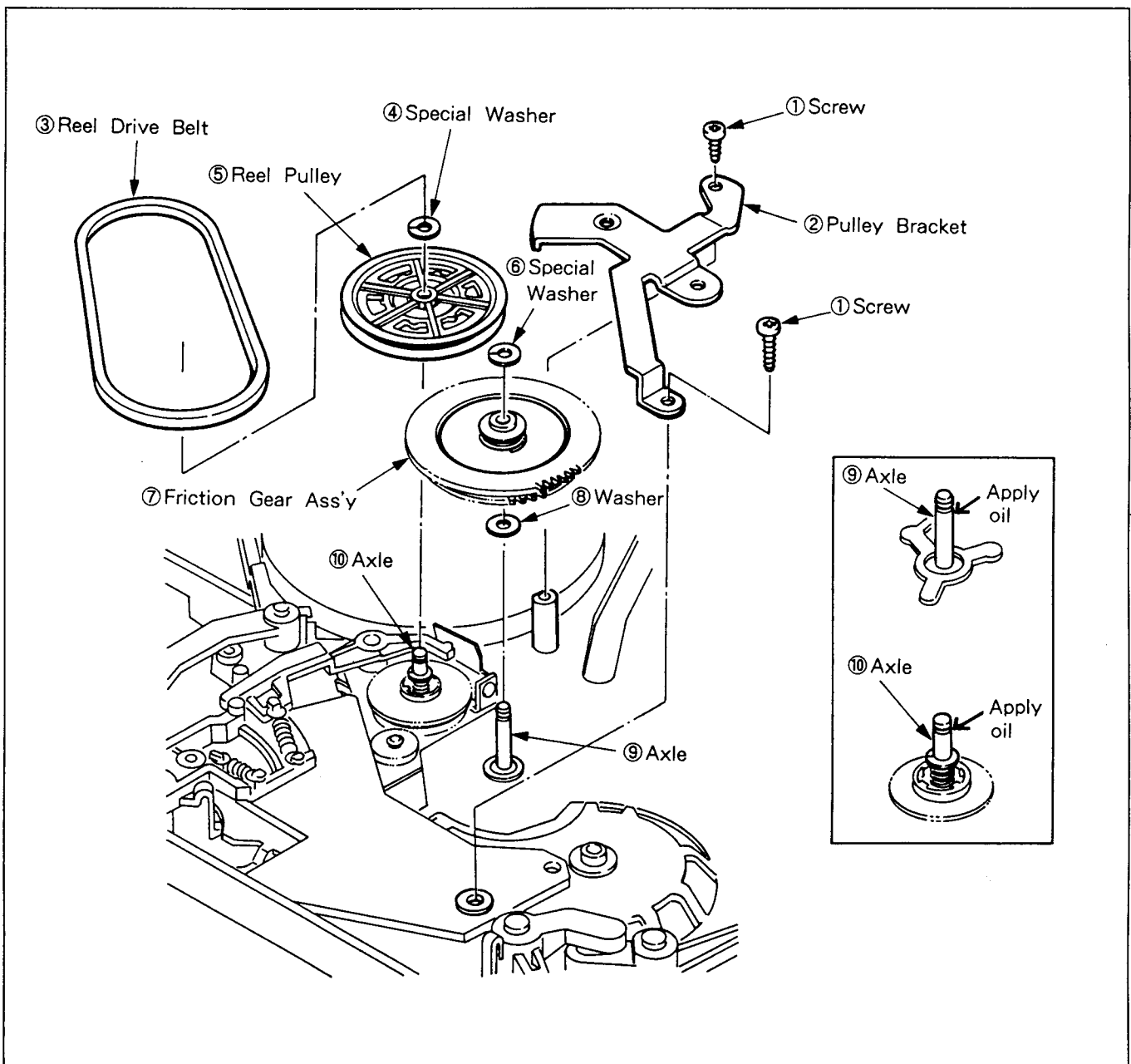


Fig. 2-8-4. Reel Pulley & Friction Gear

2-8-5. COMPL CLUTCH (See Fig. 2-8-5.)

1. Removal

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
- 3) Remove the screw ①, then remove the COMPL MC-4 ②.
- 4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

2. Remounting

- 1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.
- 2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.
- 3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in 2-8-4.
- 4) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

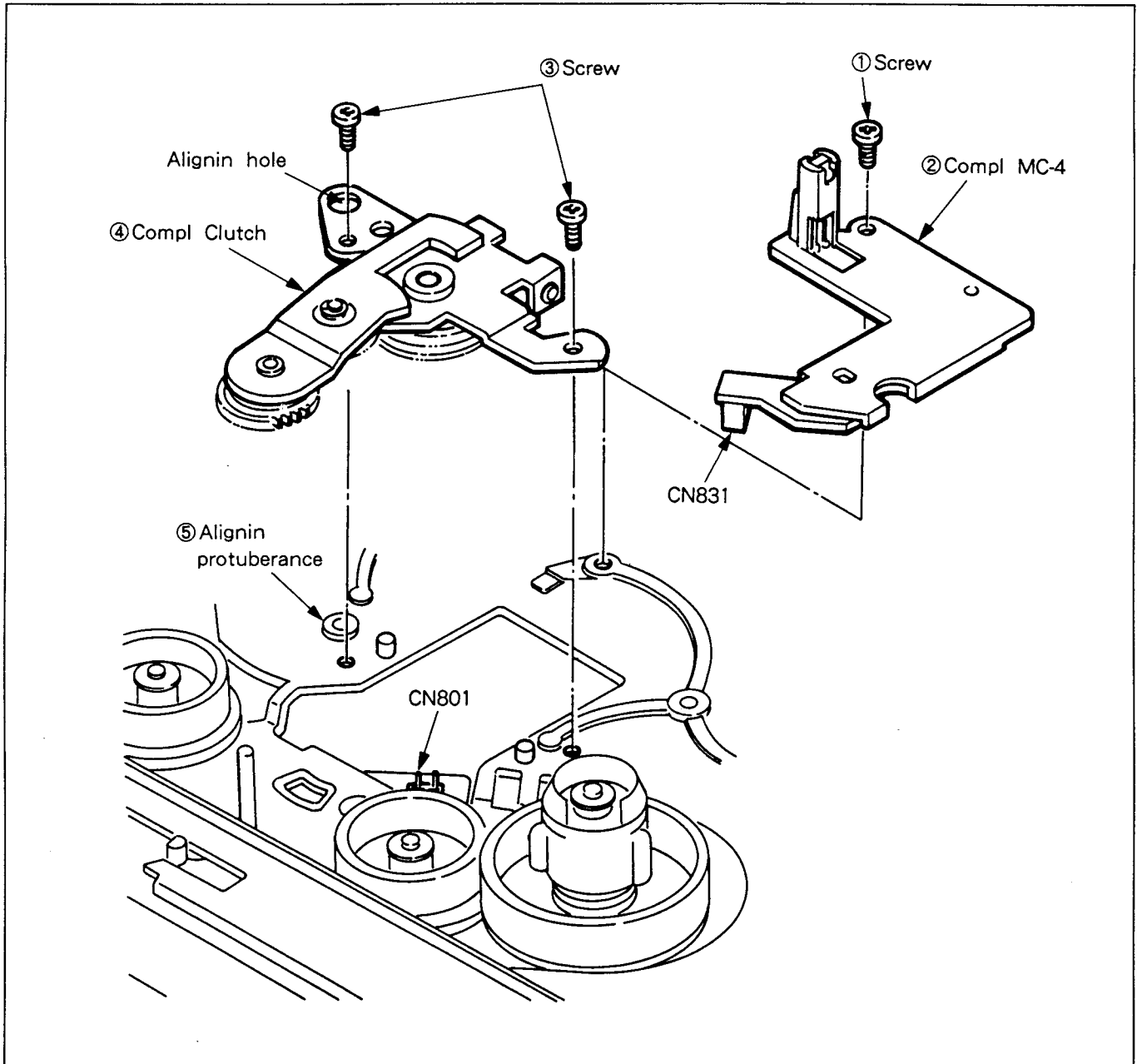


Fig. 2-8-5. Compl Clutch

2-8-6. CLUTCH CHANGE LEVER AND CLUTCH LEVER ASS'Y (See Fig. 2-8-6.)

1. Removal

- 1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.
- 2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
- 3) Remove the SPRING COIL ①.
- 4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
- 5) Remove the CS ring ④.
- 6) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

- 1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
- 2) Mount the CS ring ④ onto the axle ⑦.
- 3) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
- 4) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
- 5) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in 2-8-4.
- 6) Mount the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.

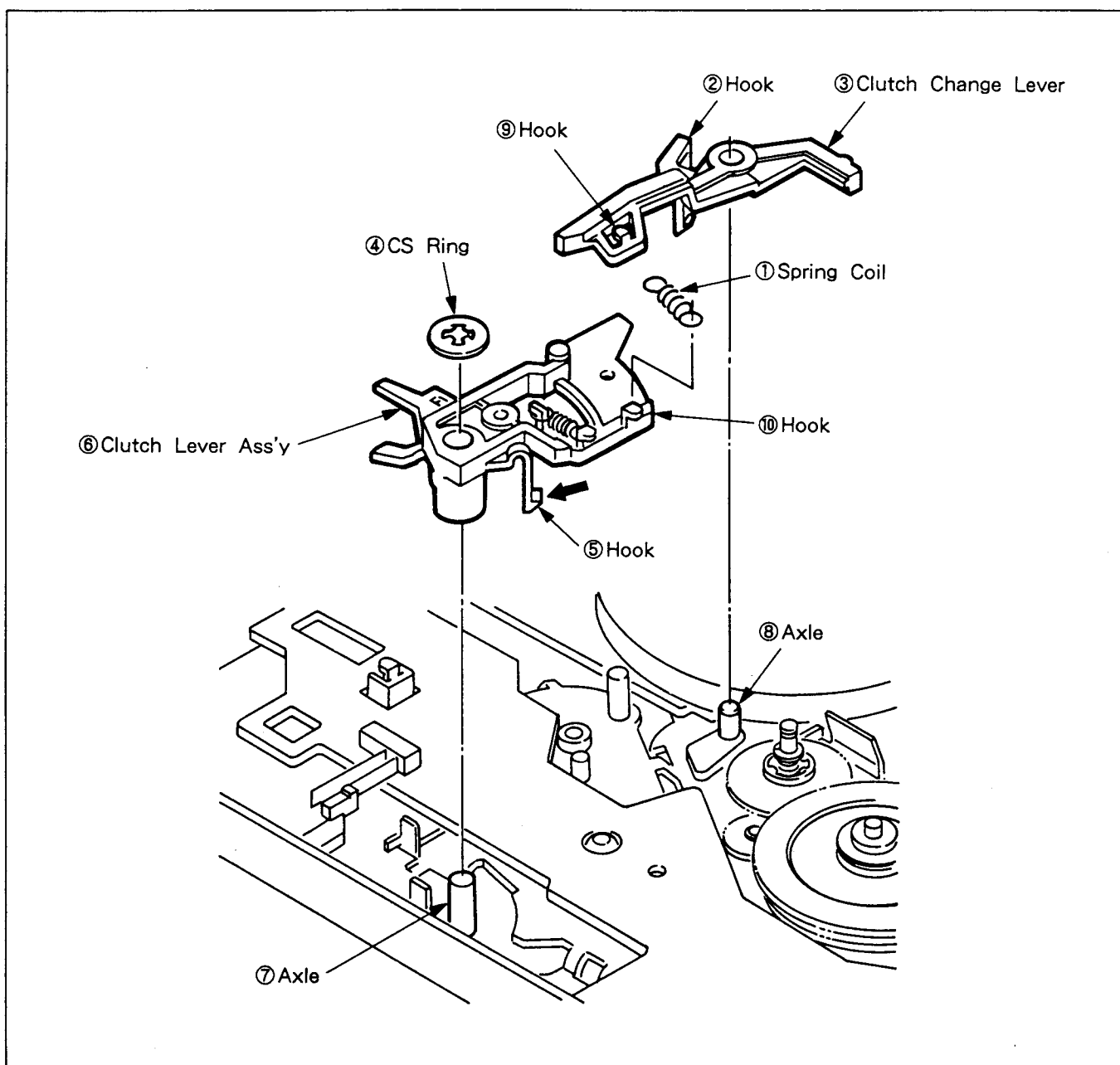


Fig. 2-8-6. Clutch Change Lever & Clutch Lever Ass'y

2.9. CAPSTAN MOTOR (See Fig. 2-9.)

1. Removal

- 1) Remove the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.
- 2) Remove the CAPSTAN MOTOR ⑥ connector.
- 3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
- 4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
- 5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note : Take care not to scratch or soil the capstan axle.

2. Remounting

- 1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
- 2) Connect the CAPSTAN MOTOR ⑥ connector.
- 3) Mount the TOP BOARD ③ with the two screws ④.
- 4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
- 5) Mount the CAPSTAN BRAKE ASS'Y as instructed in 2-7-4.

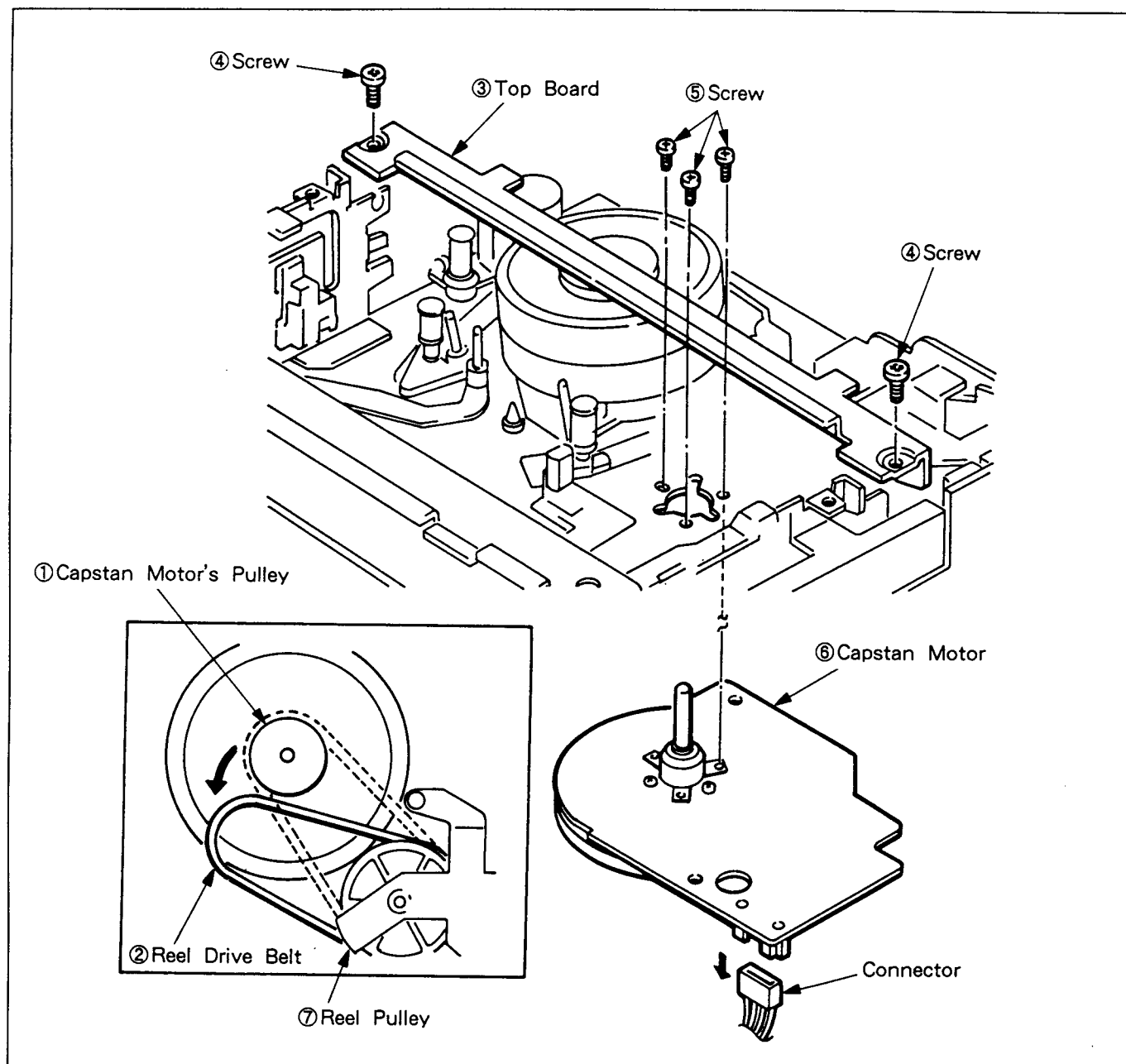


Fig. 2-9. Capstan Motor

2-10. FIXED GUIDE, FE HEAD LEVER ASS'Y

2-10-1. S-SIDE FIXED GUIDE AND FE LEVER ASS'Y (See Fig. 2-10-1.)

1. Removal

- 1) Remove the SP NUT ①, then remove the SP washer ② (upper), the GUIDE PIPE ③, the SP washer ② (lower) and the SPRING COIL ④, in that order.
- 2) Remove the SPRING COIL ⑤.
- 3) Remove the FTE HEAD connector.
- 4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

2. Remounting

- 1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
- 2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
- 3) Connect the SPRING COIL ④, the SP washer ② (lower), the GUIDE pipe ③, the SP washer ② (upper) and the SP NUT ① to the axle ⑧, in that order.
- 4) Connect the connector to the FTE HEAD.
- 5) Perform height adjustment of the fixed guide (S) as instructed in 5-4.

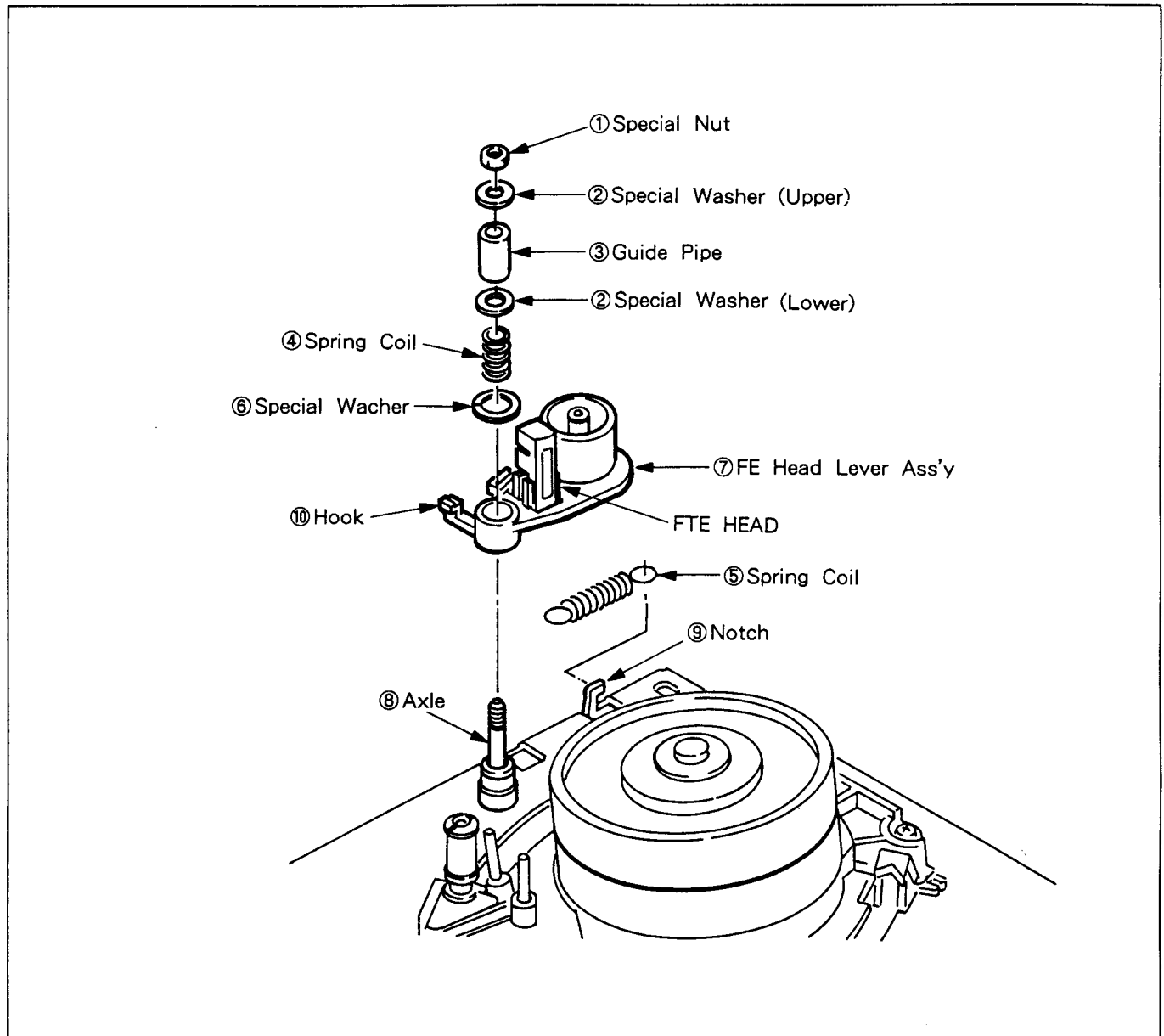


Fig. 2-10-1. Fixed Guide (S) & FE Lever Ass'y

2-10-2. IMPEDANCE ROLLER, FTE HEAD

(See Fig. 2-10-2.)

1. Removal

- 1) Remove the FTE HEAD (full track erase head) ① connector.
- 2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
- 3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note: Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting

- 1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
- 2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
- 3) Connect the connector to the terminal of the FTE HEAD ①.

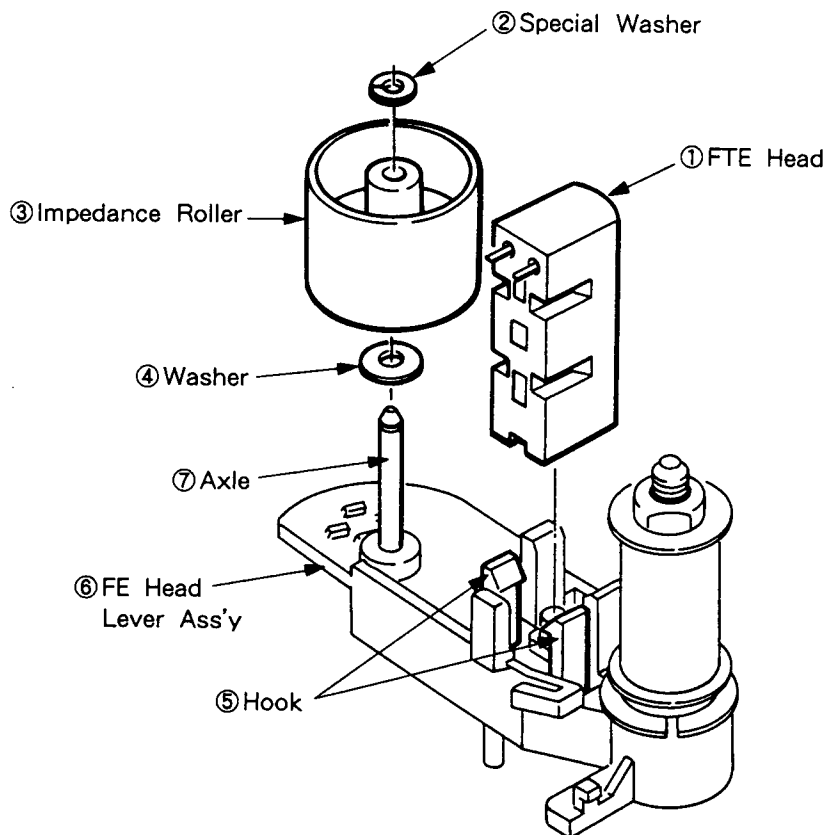


Fig. 2-10-2. Impedance Roller & FTE Head

2-10-3. Fixed Guide (T) (See Fig. 2-10-3.)

1. Removal

- 1) Remove the CAP ①.
- 2) Remove the SP NUT ②, then remove the SP washer ③ (upper), the GUIDE PIPE ④, the SP washer ③ (lower) and the SPRING COIL ⑤, in that order.

Note: Shape of the CAP differ from drawing in the figure depending on the model.

2. Remounting

- 1) Mount the SPRING COIL ⑤, the SP washer ③ (lower), the GUIDE PIPE ④, the SP washer ③ (upper) and the SP NUT ②, in that order, to the axle ⑥.
- 2) Mount the CAP ① onto the axle ⑥.
- 3) Perform height adjustment of the fixed guide (T) as instructed in 5-4.

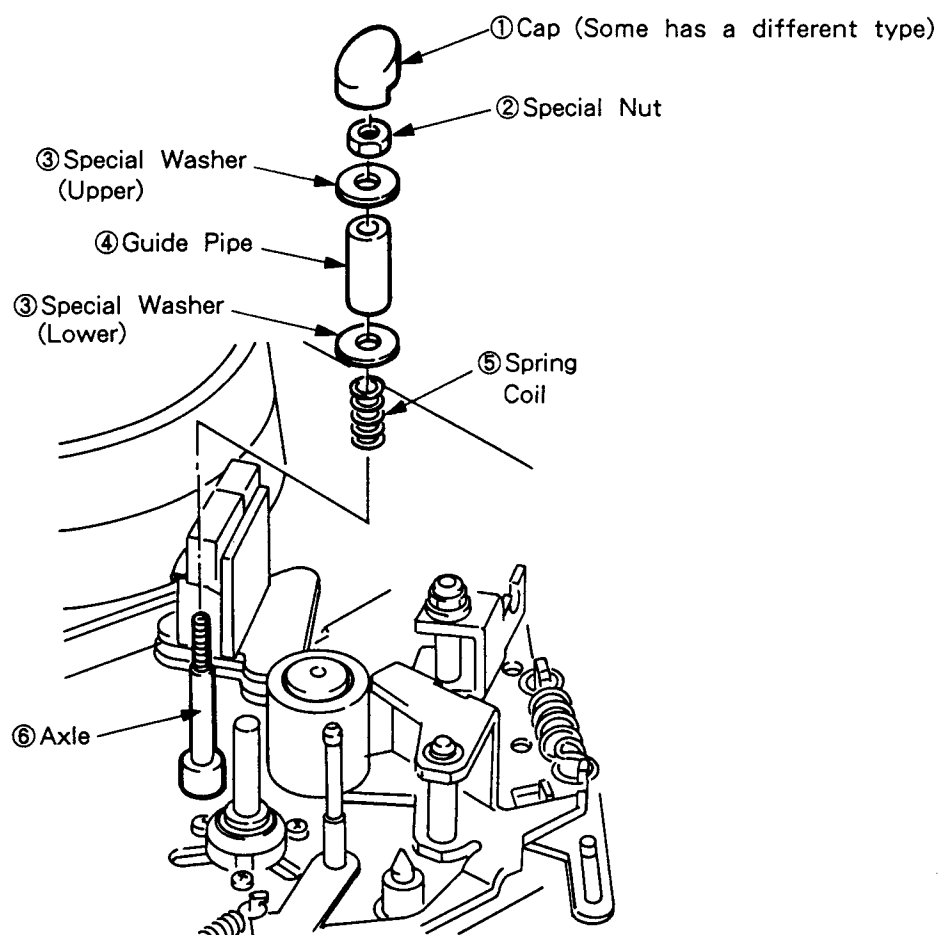


Fig. 2-10-3. Fixed Guide (T)

2-11. DRUM SECTION

2-11-1. DRUM MOTOR (ROTOR, STATOR)

(See Fig. 2-11-1.)

1. Removal

- 1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
- 2) Remove the two screws ③, then remove the ROTOR ④.
- 3) Remove the STATOR board connector.
- 4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

- 1) Mount the STATOR ⑥ with the three screws ⑤.
- 2) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.
- 3) Insert the connector ⑩.
- 4) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1: Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3 kg-cm.

Note 2: When the drum unit has been replaced, perform a tape path adjustment as instructed in 5-4. and perform a PB PHASE adjustment of the servo circuit.

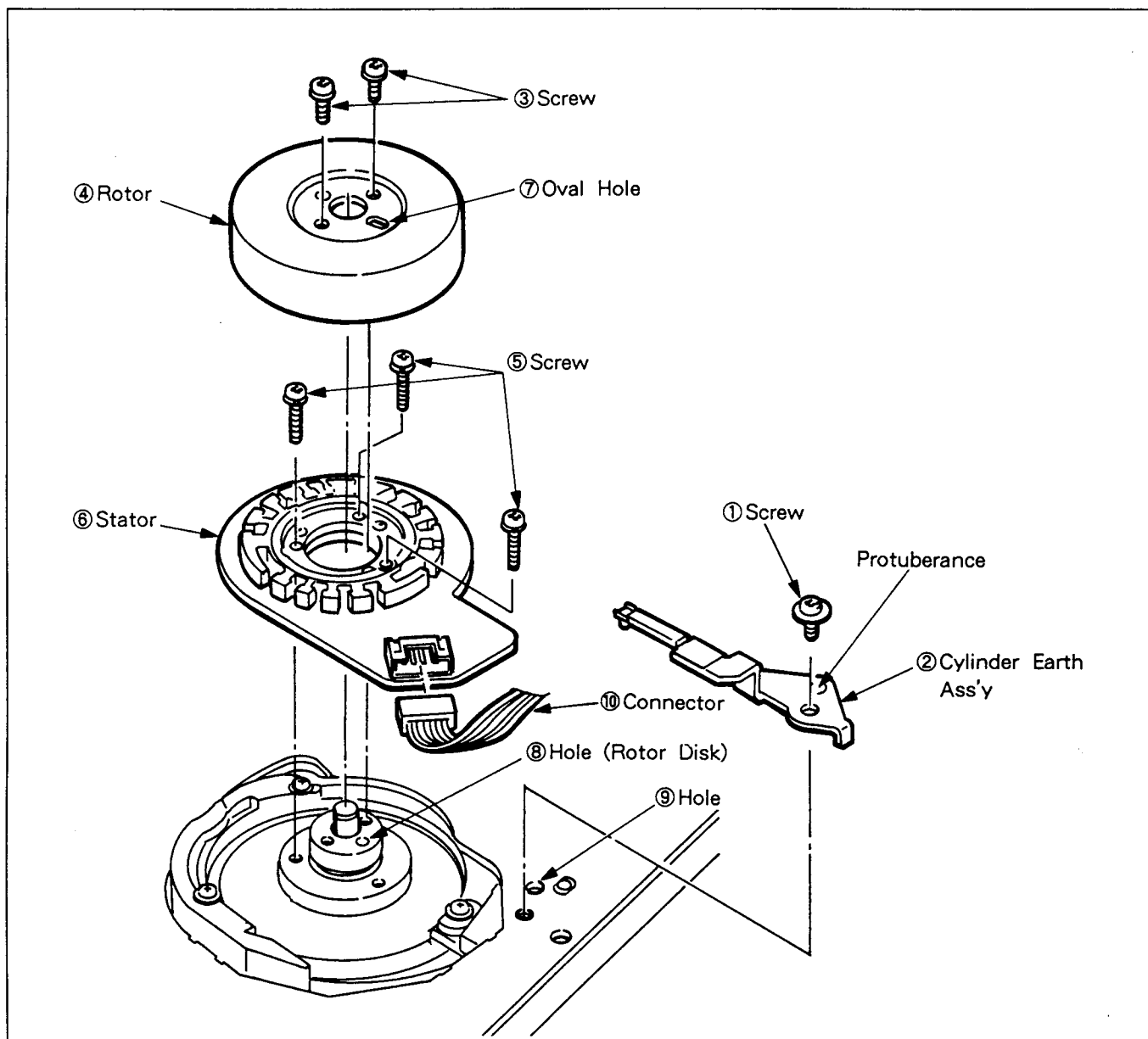


Fig. 2-11-1. Drum Motor

2-11-2. DRUM UNIT (See Fig. 2-11-2.)

1. Removal

- 1) For some models with the board located above the upper drum, remove the board.
- 2) Remove the flexible P.C.B. ① from the HEAD AMP PCB ASS'Y (take care not to pull the flexible P.C.B. in the upward direction).
- 3) Remove the LOAD RACK only, as instructed in 2-4-1.
- 4) Remove the three screws ②, then remove the drum unit ③.

Note 1 : When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

- 1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.
- 2) Mount the ROAD RACK as instructed in 2-4-1.
- 3) Insert the flexible P.C.B. into the HEAD AMP PCB ASS'Y.
- 4) Clean the drum unit.
- 5) Perform the tape path adjustment as instructed in 5-4. and perform the PB PHASE adjustment of the servo circuit.

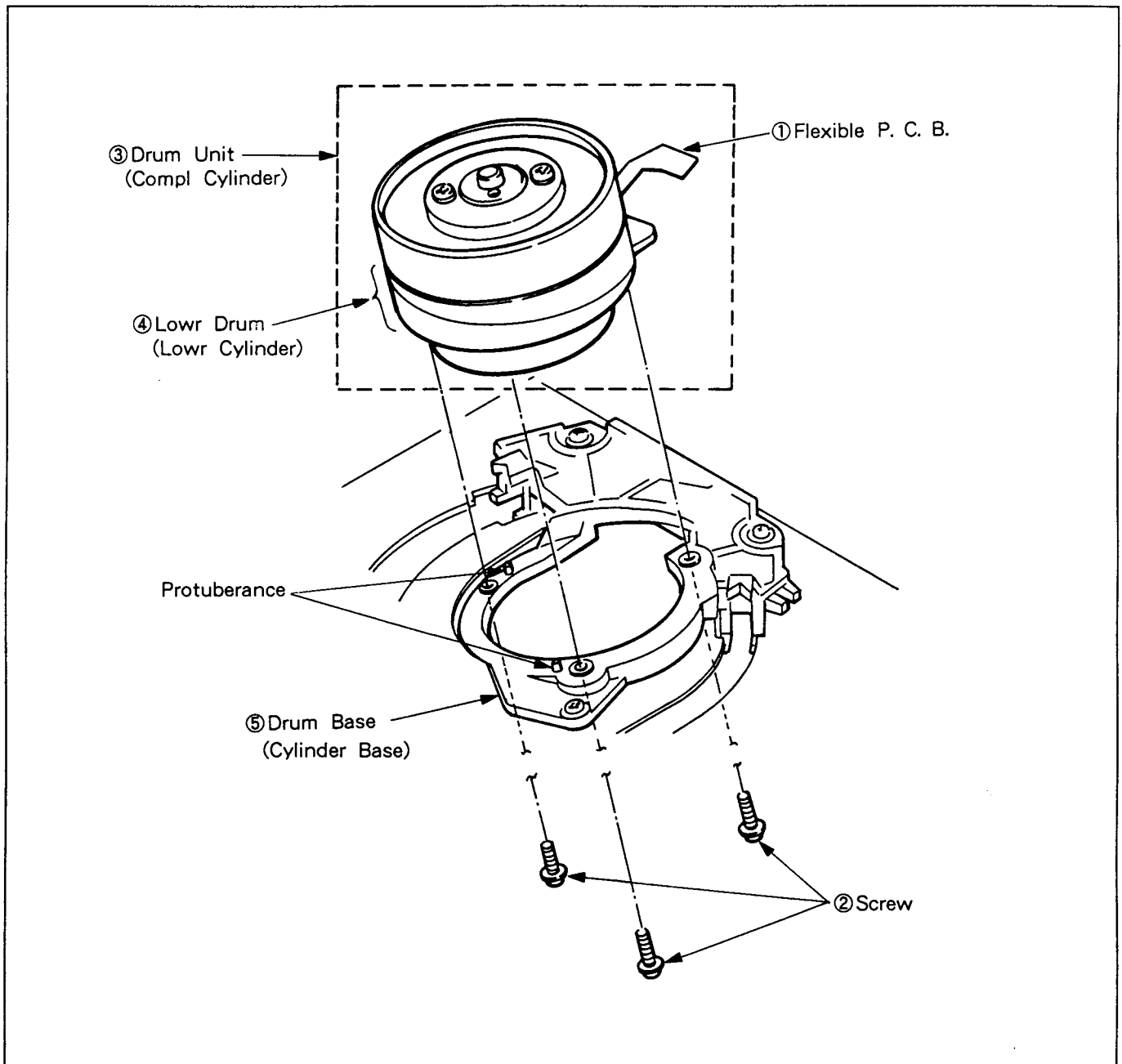


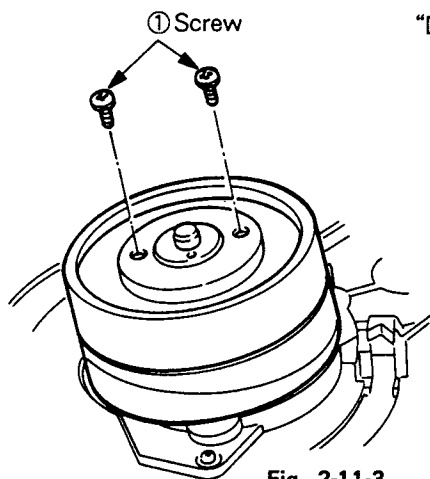
Fig. 2-11-2. Drum Unit (Compl Cylinder)

2-11-3. UPPER DRUM (Upper Cylinder)

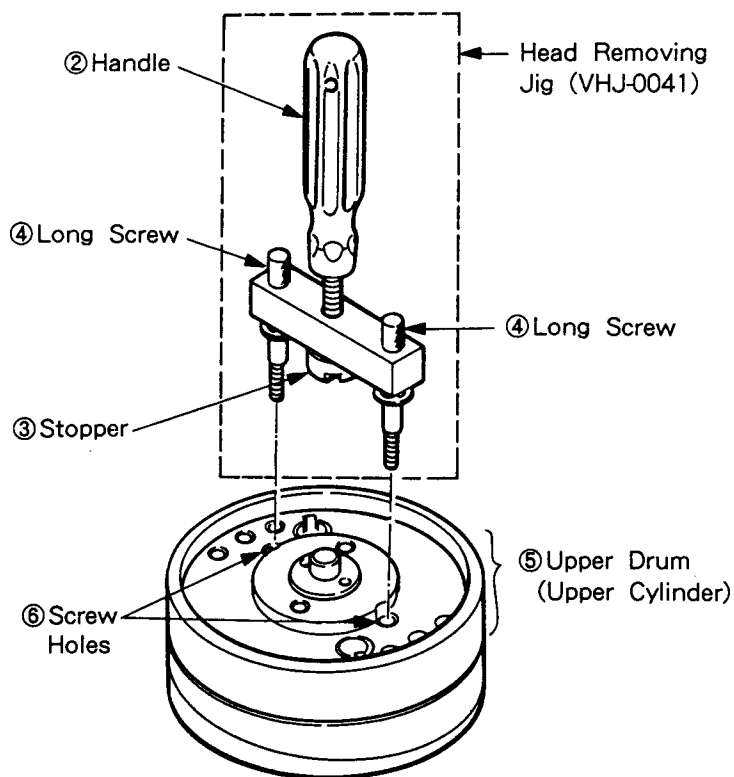
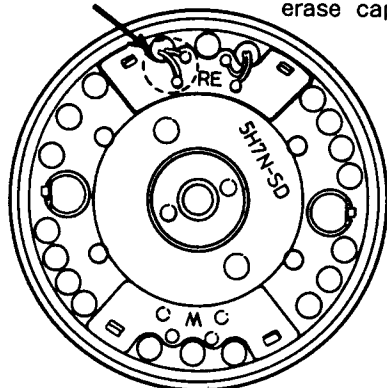
1. Removal

- 1) Remove the two screws ① (see Fig. 2-11-3).
- 2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board (see Fig. 2-11-4.).
- 3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③ (see Fig. 2-11-5.).
- 4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
- 5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
- 6) Remove the jig from the upper drum.

Note: Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.



Lead wires of
Rotary Erase Head (Model for flying
erase capability)



Upper Drum (Upper Cylinder)

2. Remounting (See Fig. 2-11-6.)

- 1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact portion are free from scratches and dirt.
- 2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side).
- 3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole. (See Fig. 2-11-4.)

- 4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.
- 5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6 kg-cm using a torque driver (VHJ-0014) and a 3 mm bit (VHJ-0045).
- 6) In case the RE head is attached to the upper drum, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note : When the upper drum has been replaced, perform a tape path adjustment as instructed in 8-4. and the PB PHASE adjustment of the servo circuit.

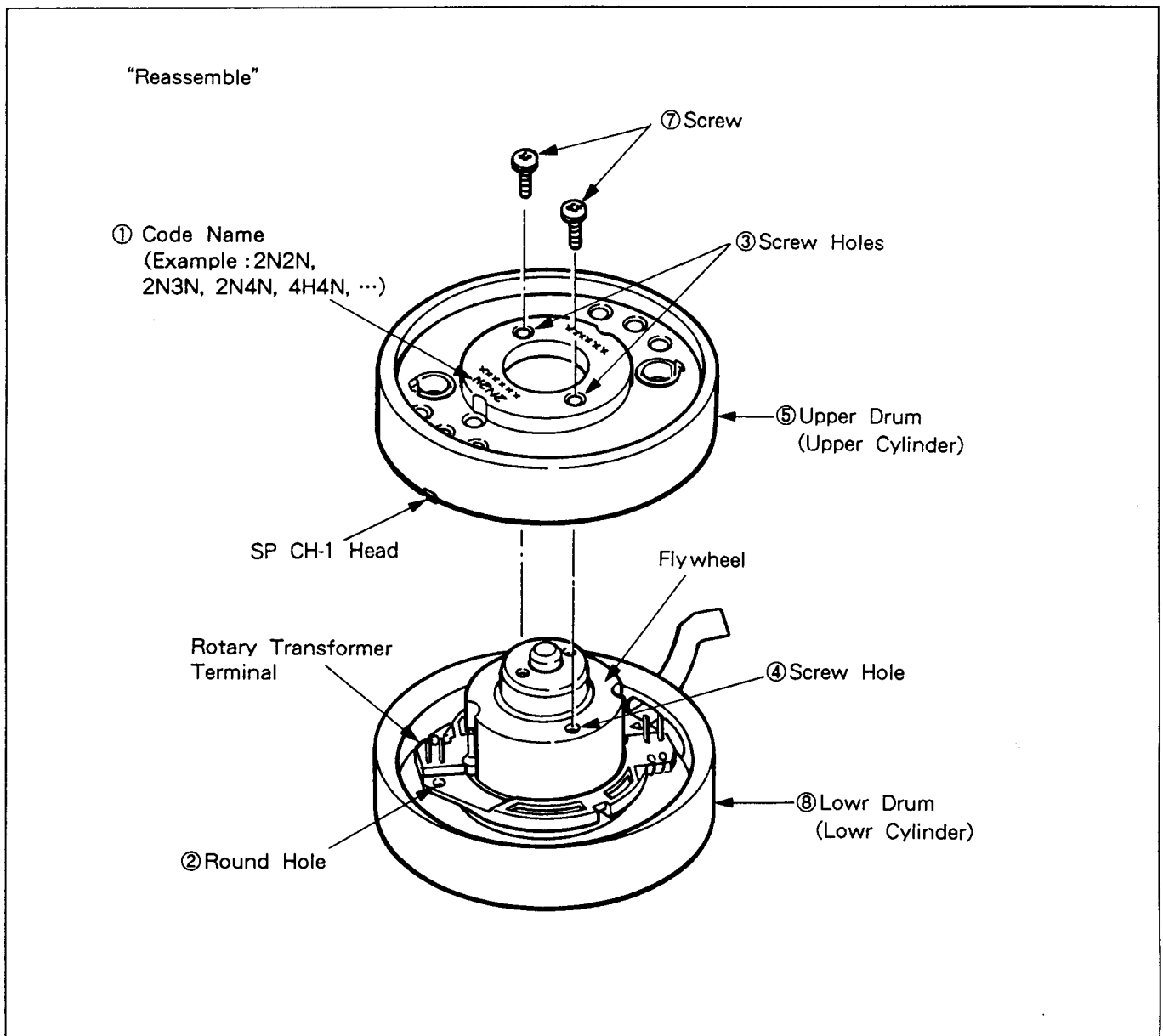


Fig. 2-11-6.

3. Recognizing the SP CH-1 Head Side

No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P88 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 2-11-7.) This code name differs according to the drum type, but its basic form is as follows:

A = Number of head bases

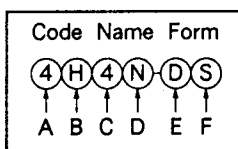
B = "N" for normal audio

"H" for HI-FI audio

C = Number of heads

D = TV system ("N" or "P")

EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.



Examples of Detailed Classification Codes

V = Head with level difference

D = Compatible with digital units

S = SVHS-compatible

Examples of Code Names

2N2N, 2N2N-V, 2N3N, 2N4N, 4H4N, 4H4N-O, 4H5N, 4H6N, 4H6N-S, 5H7N-SD,

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 2-11-8, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note: When ordering parts such as drums (CYLINDERS), do not use the code names; always refer to the parts list and order with the specified part numbers.

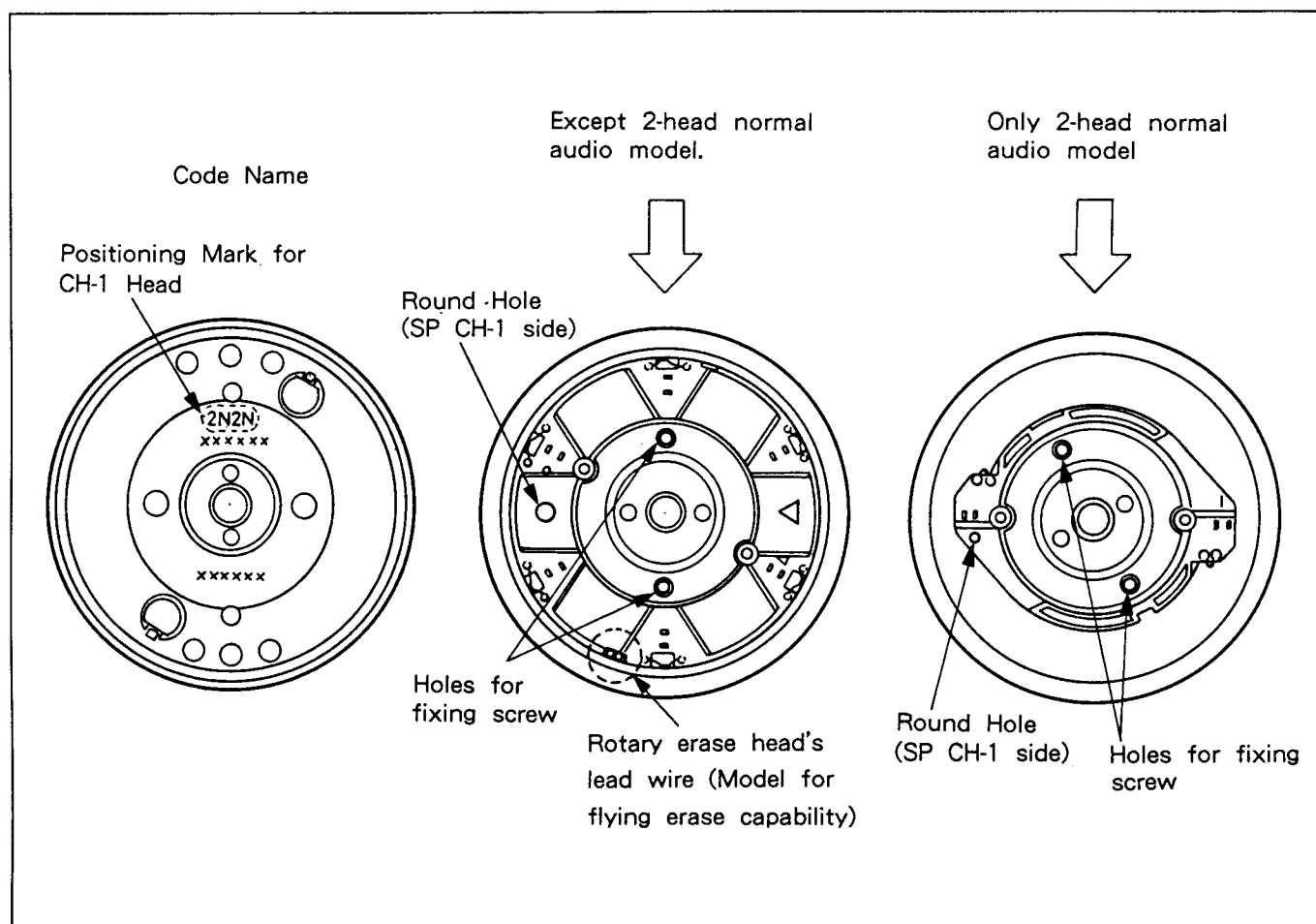


Fig. 2-11-7. Upper Drum

Fig. 2-11-8. Lower Drum

2-12. HOW TO PROCEED WHEN THE CASSETTE CANNOT BE REMOVED

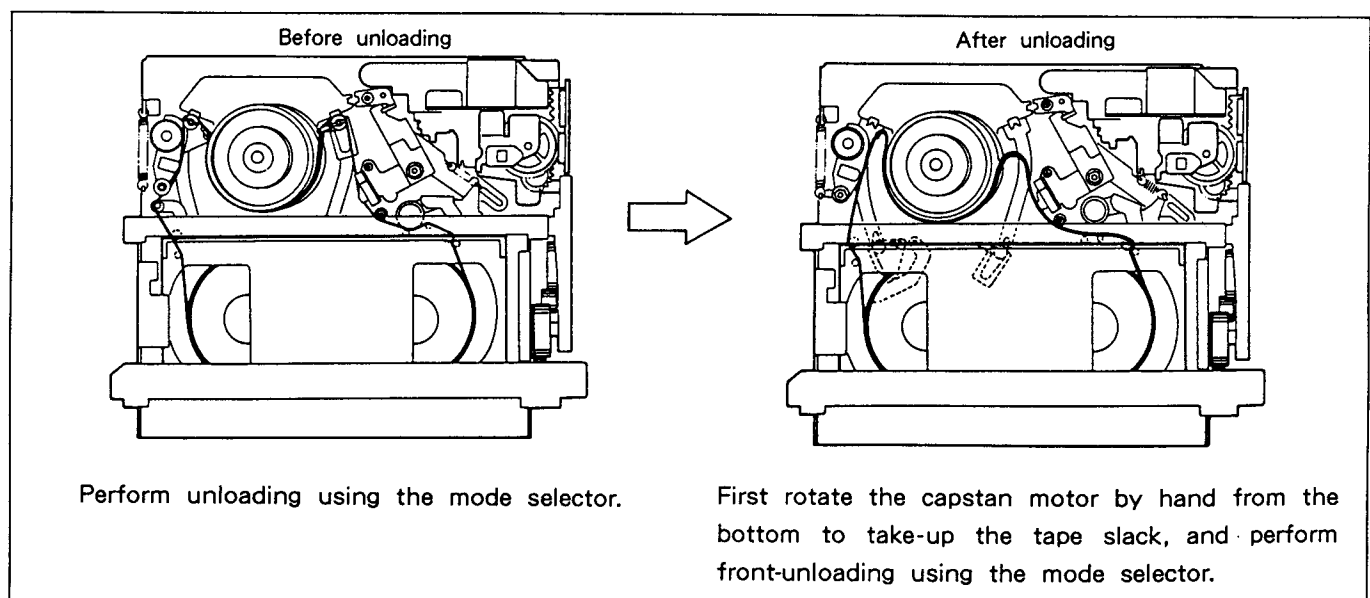
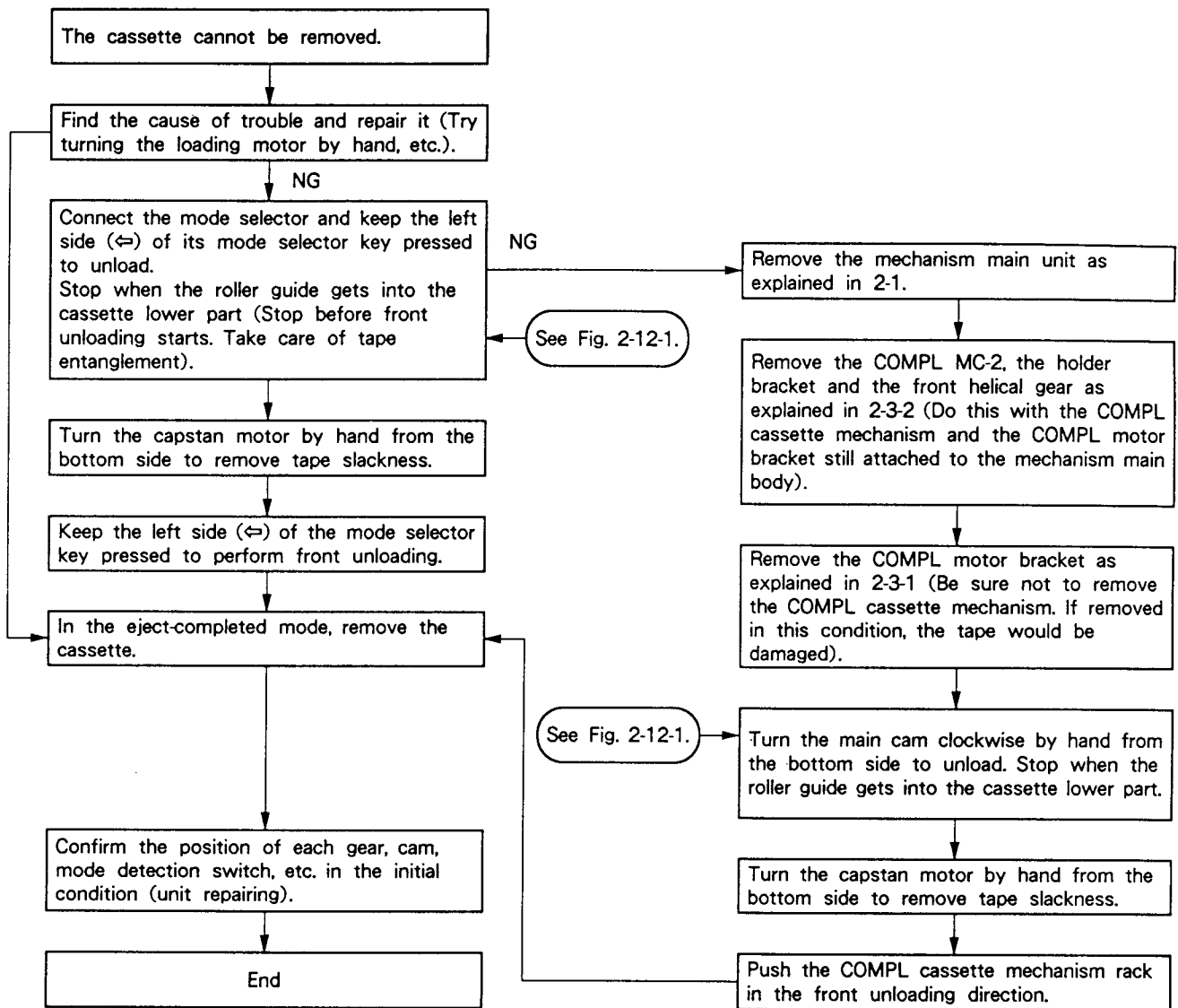
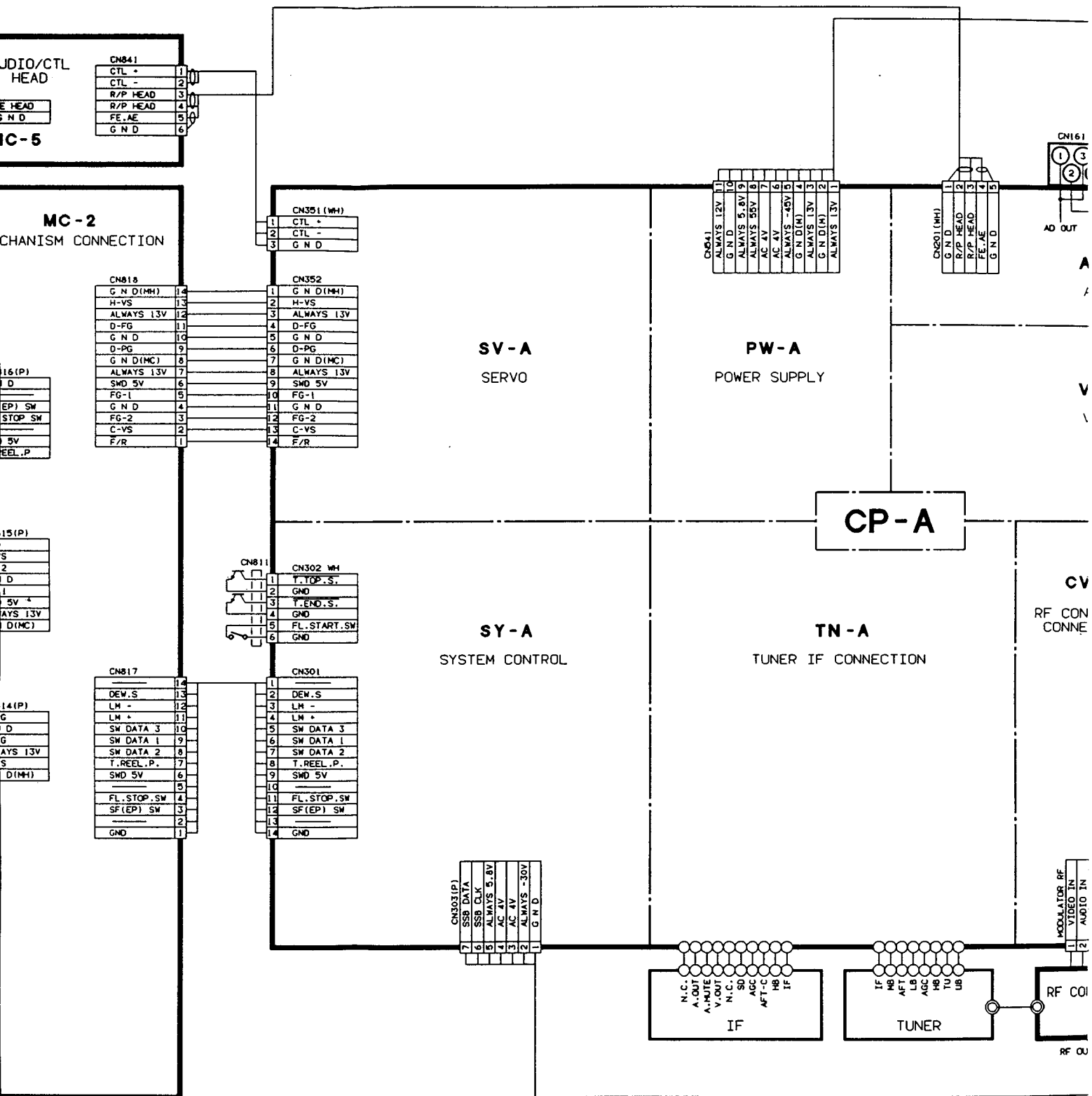


Fig. 2-12-1

A — B — C — D — E — F — G — H — I — J — K

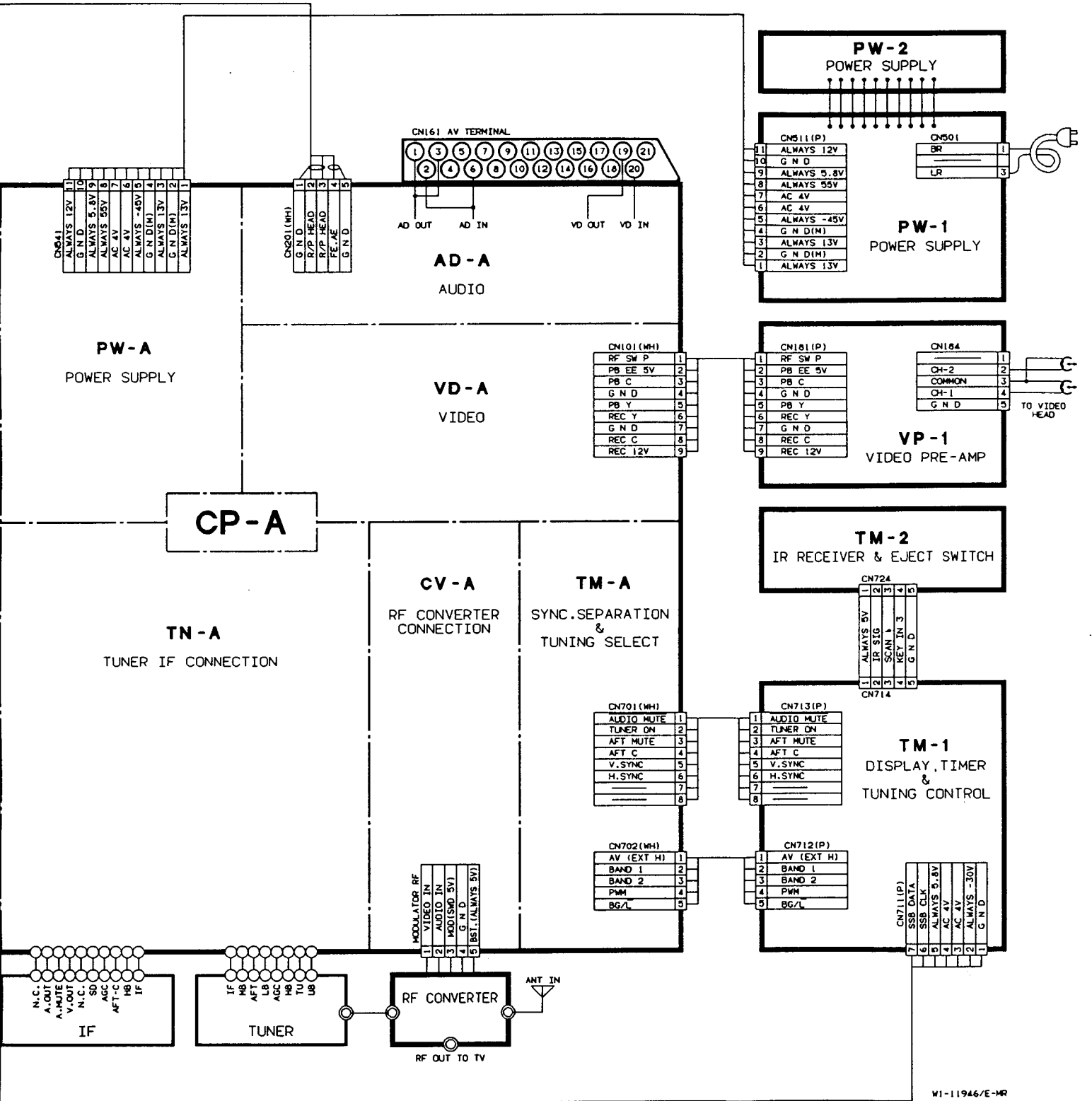


3-1. OVERAL WIRING DIAGRAM

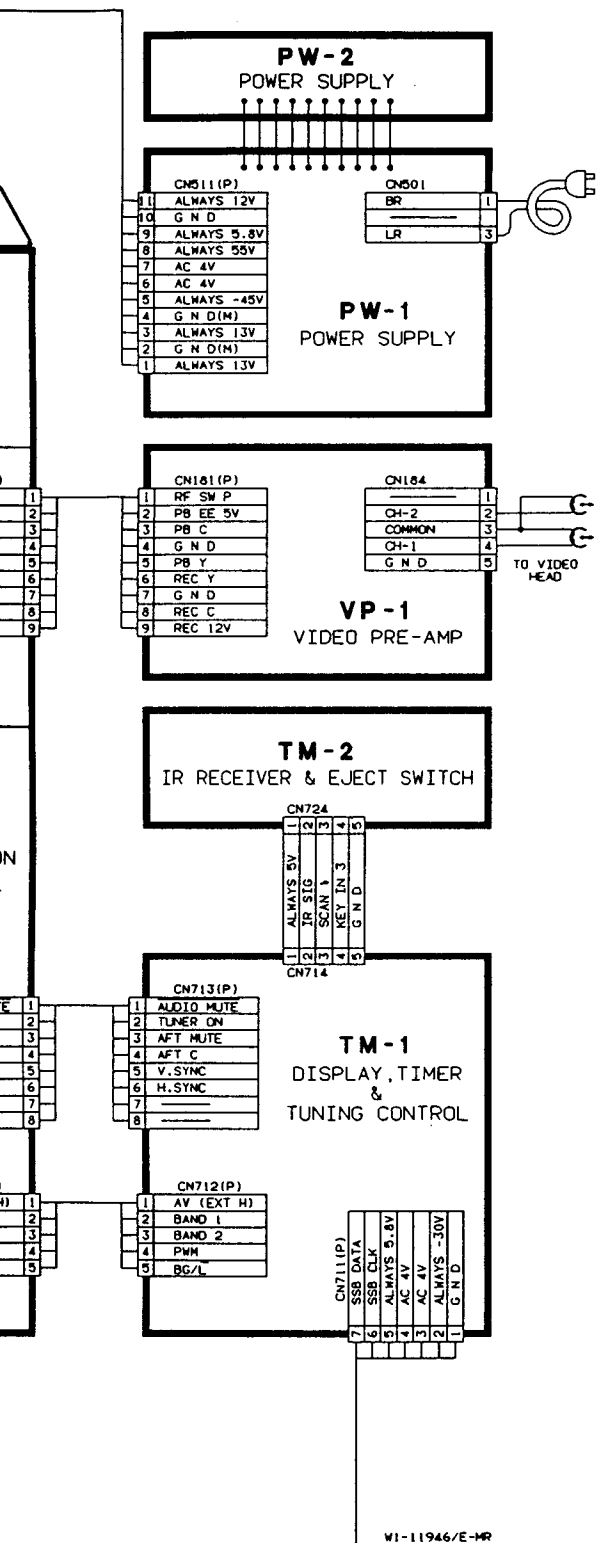


3-1. OVERAL WIRING DIAGRAM

For Service Manuals
contact
MAURITRON SERVICES
8 Cherry Tree Road, Chinnor
Oxfordshire, OX9 4QY.
Tel (01844) 351694
Fax (01844) 352554

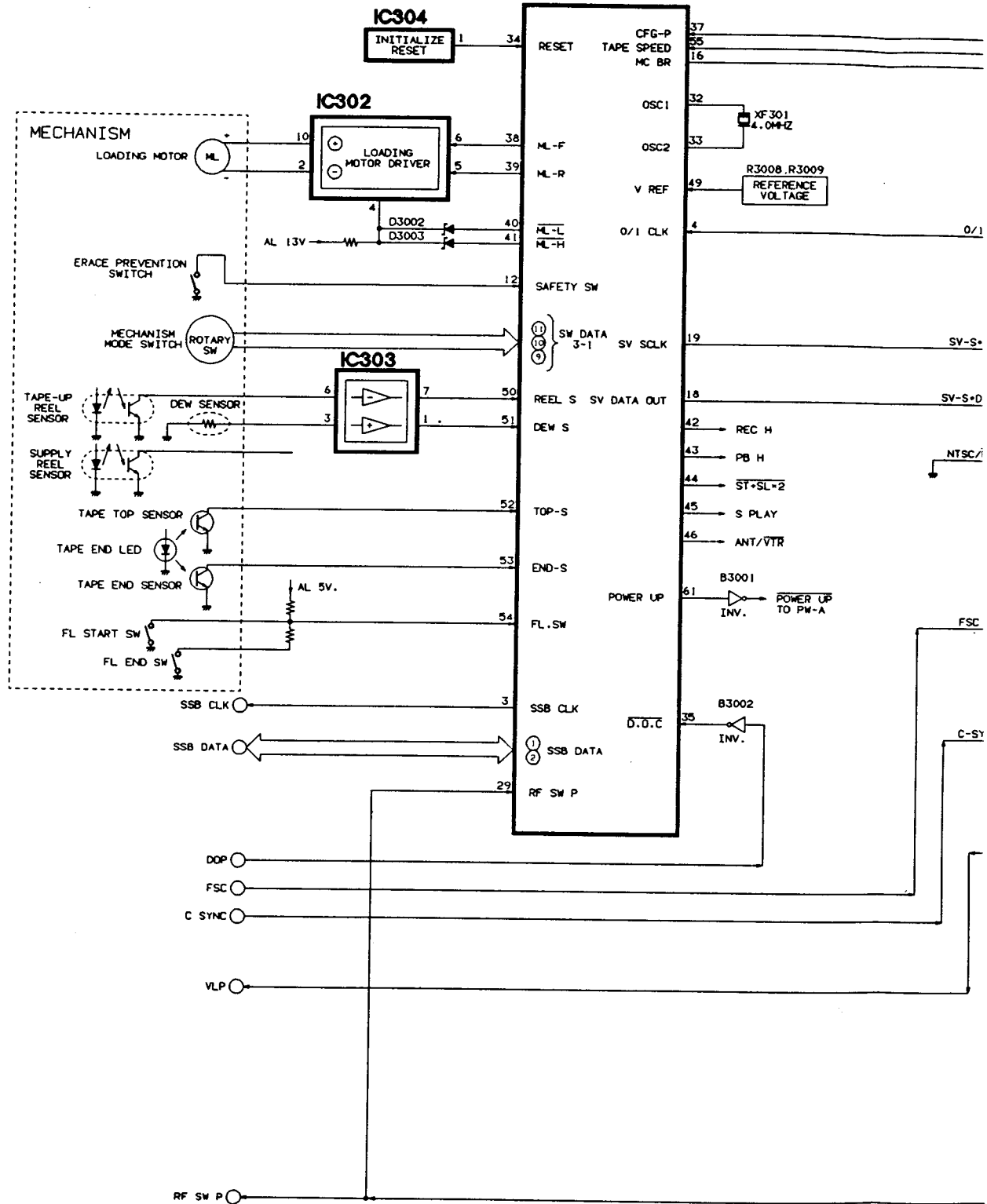


W1-11946/E-MR



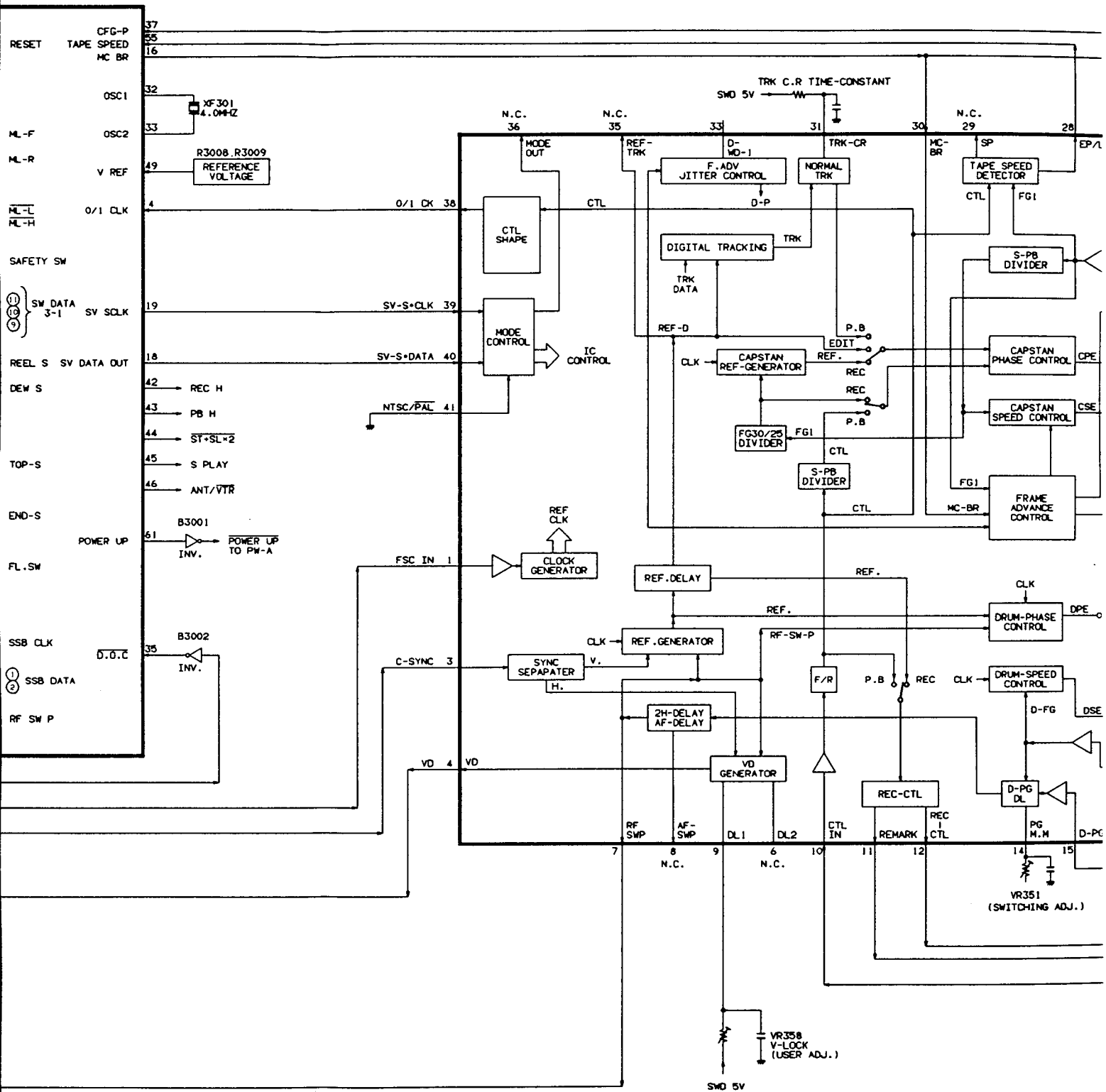
W1-11946/E-MR

IC301 SYSTEM-CONTROL



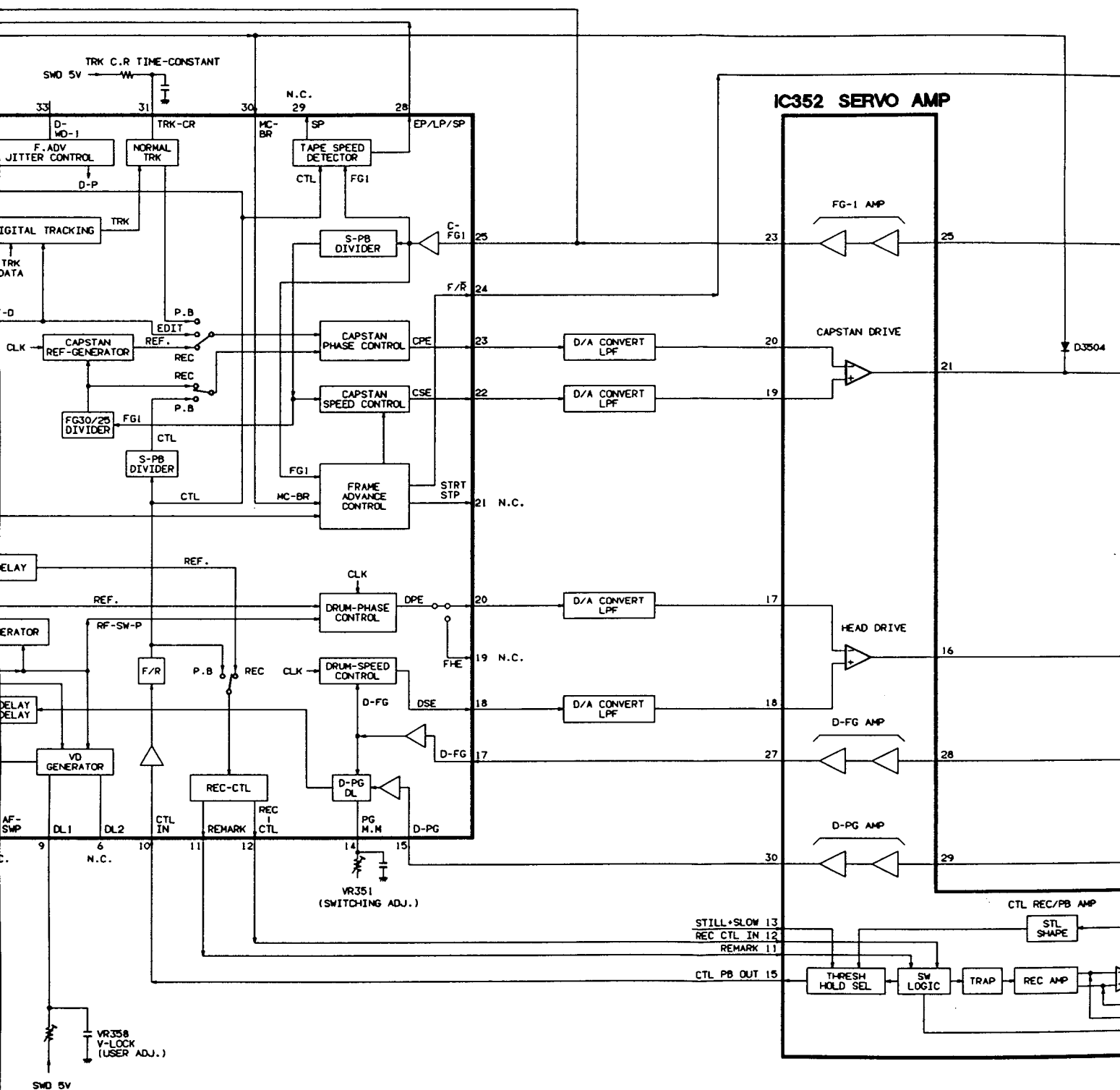
1 SYSTEM-CONTROL

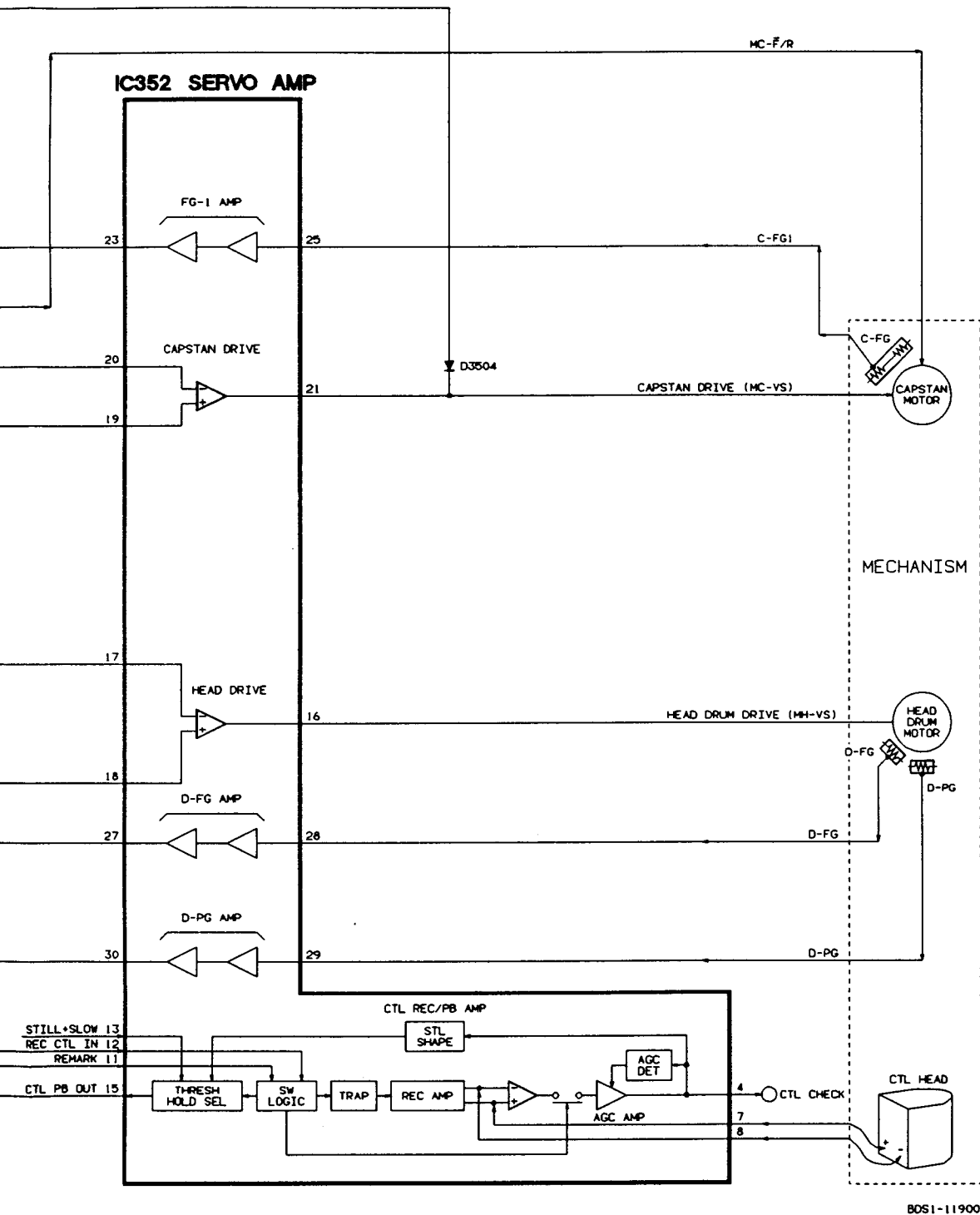
IC351 DIGITAL SERVO



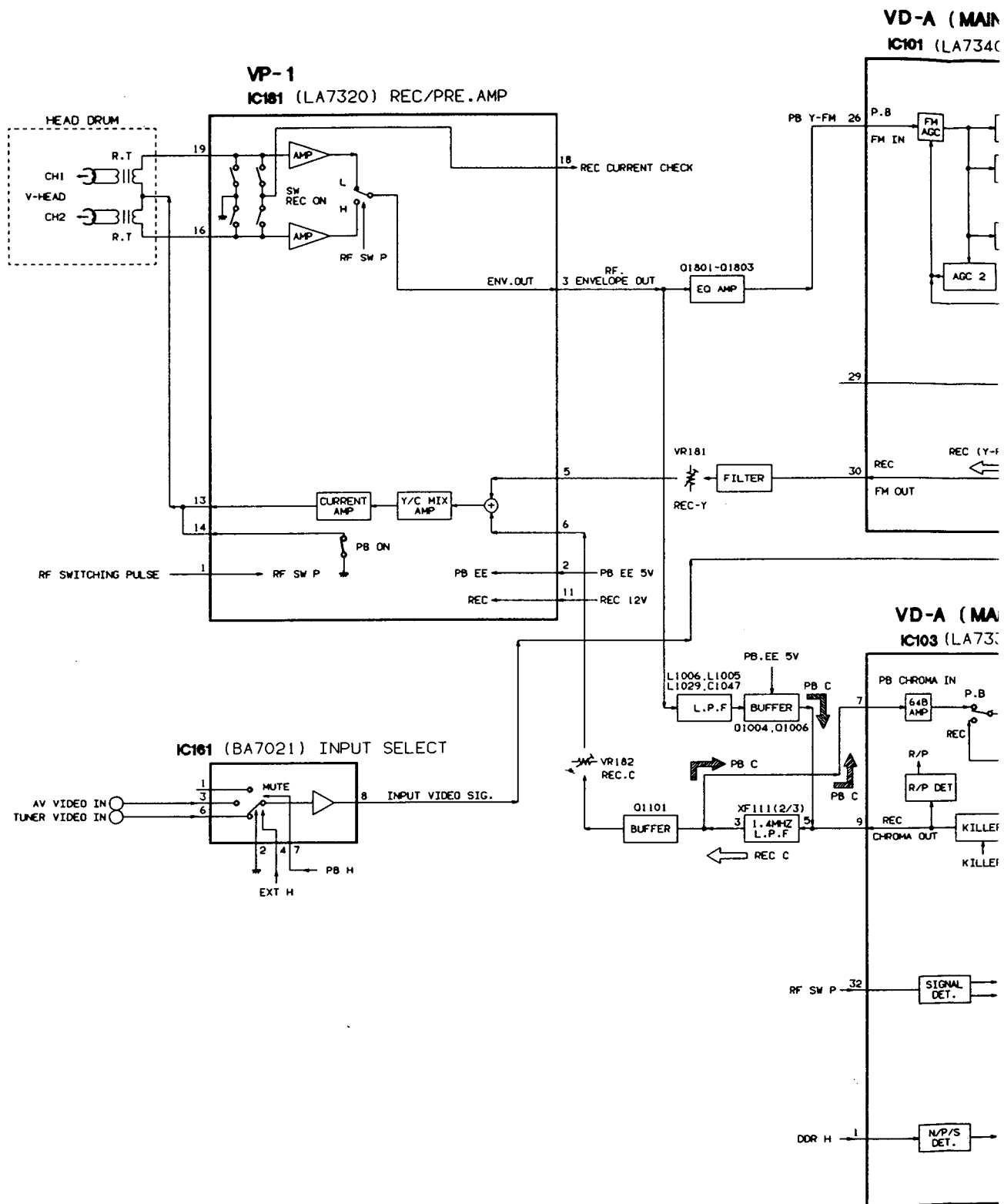
3-2. SYSTEM CONTROL & SERVO CIRCUIT BASIC BLOCK DIAGRAM

IC351 DIGITAL SERVO





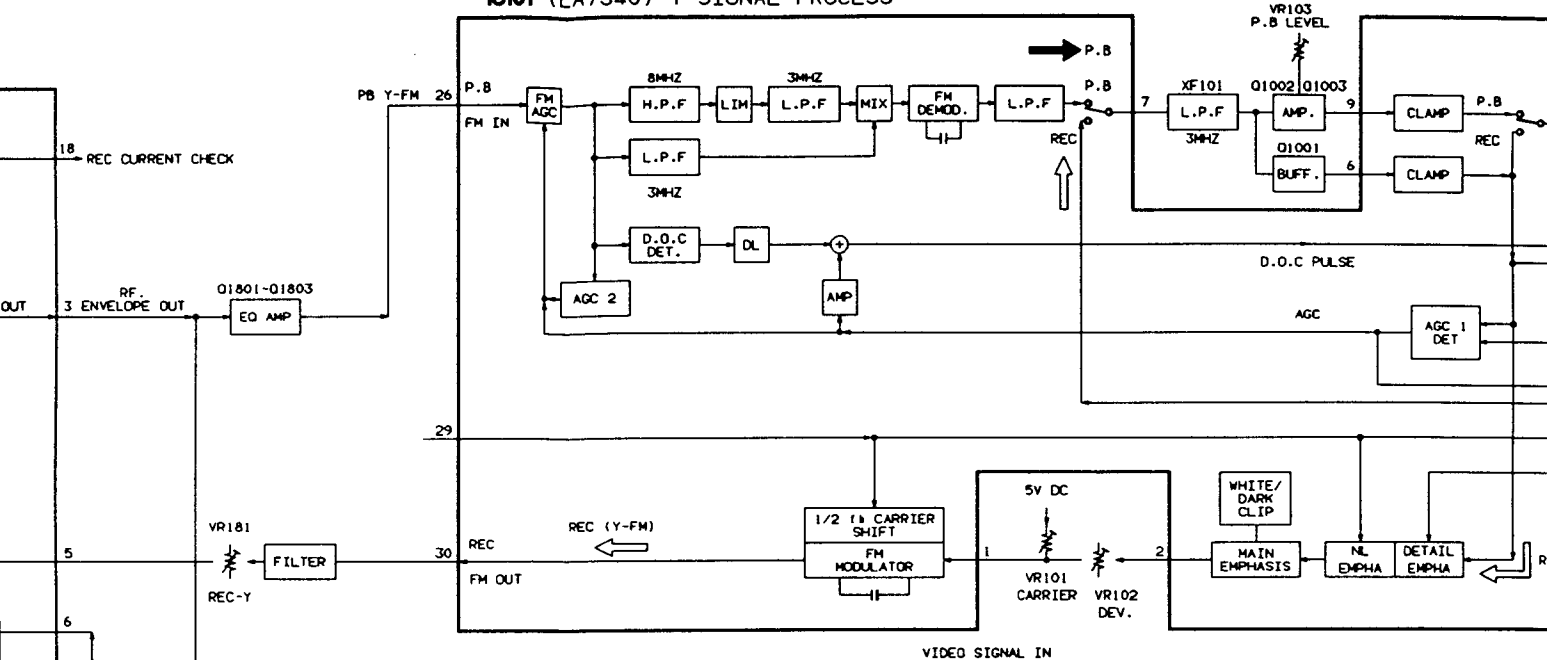
BOS1-11900



3-3. VIDEO CIRCUIT BASIC BLOCK DIAGRAM

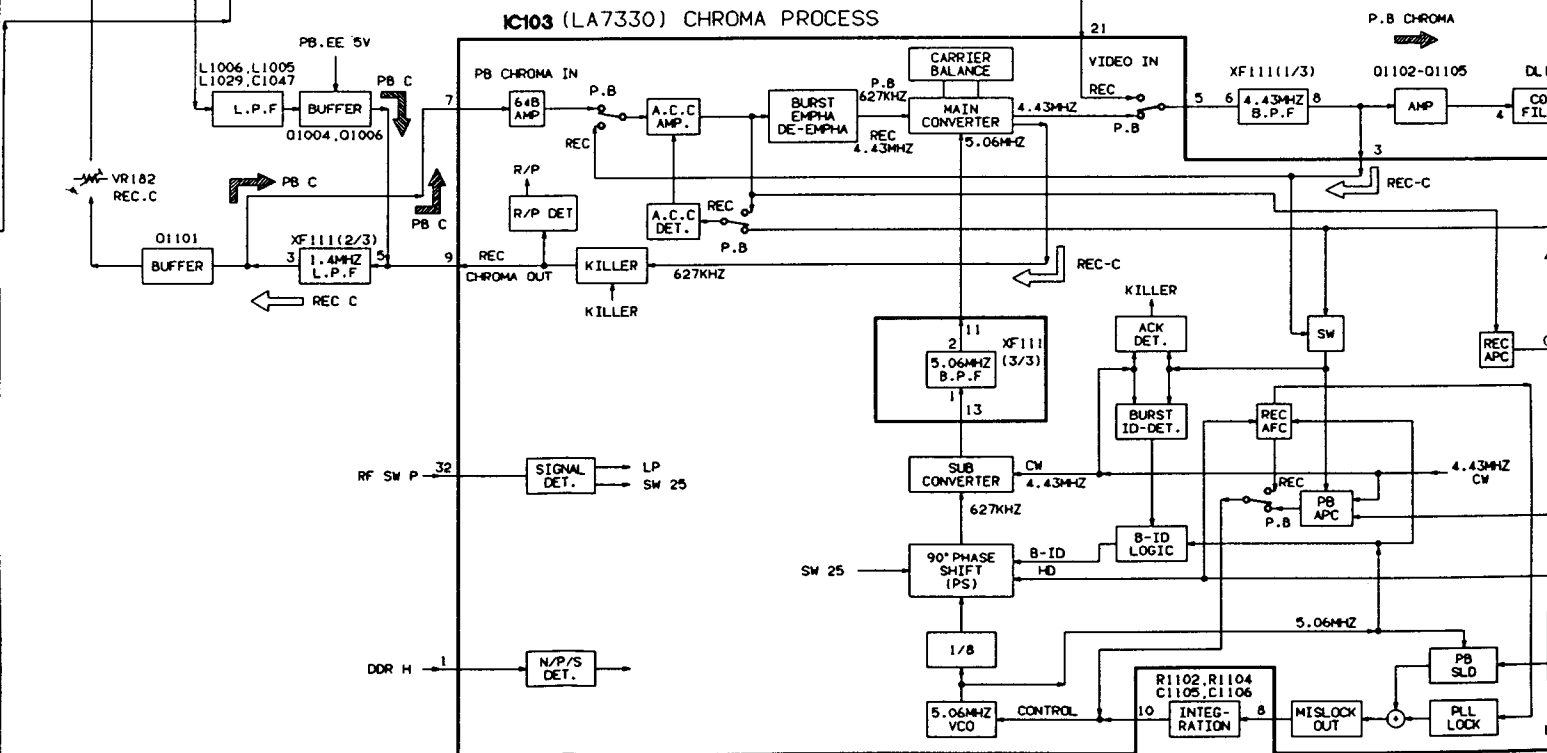
VD-A (MAIN BOARD CP-1)

IC101 (LA7340) Y-SIGNAL PROCESS

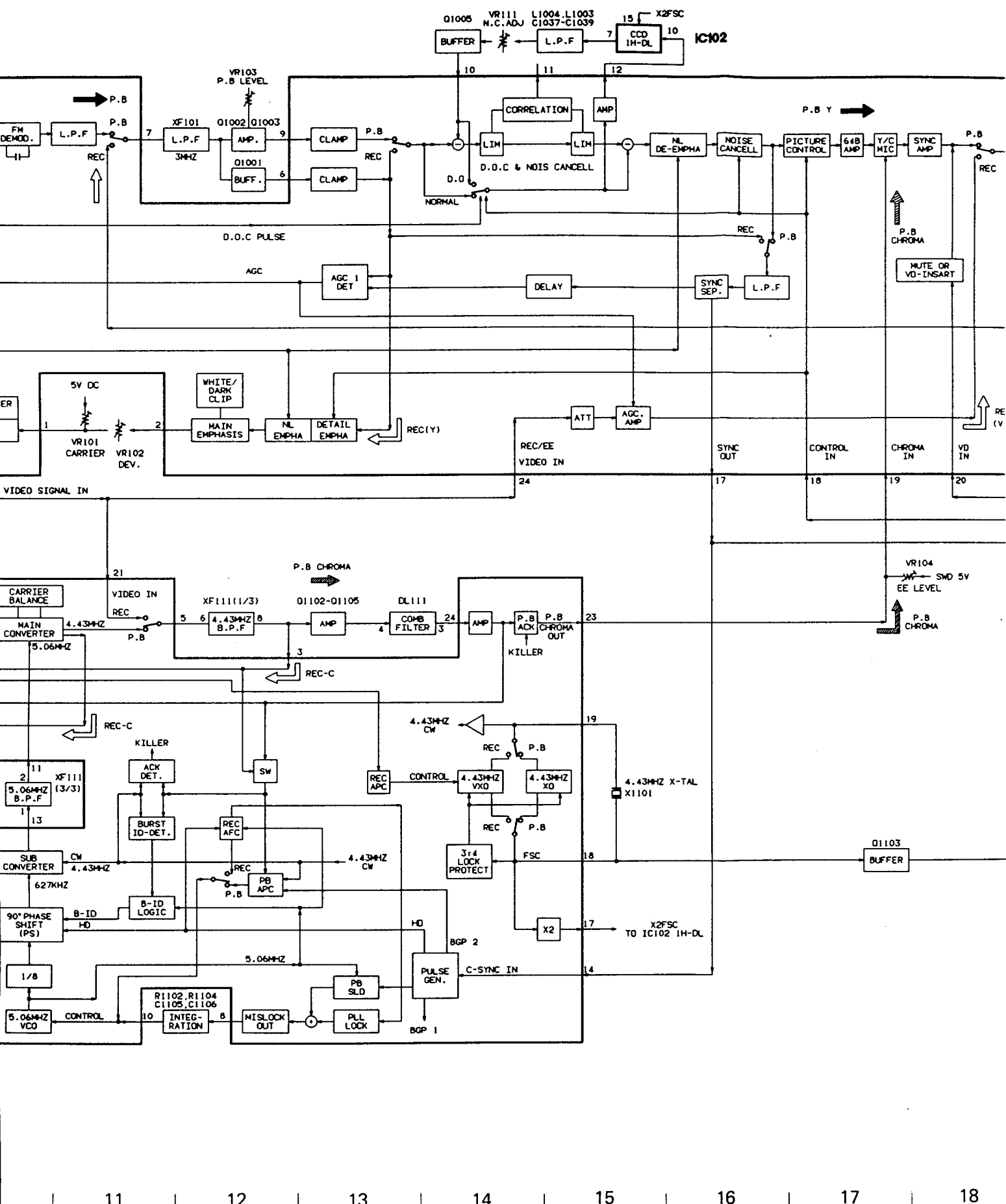


VD-A (MAIN BOARD CP-1)

IC103 (LA7330) CHROMA PROCESS



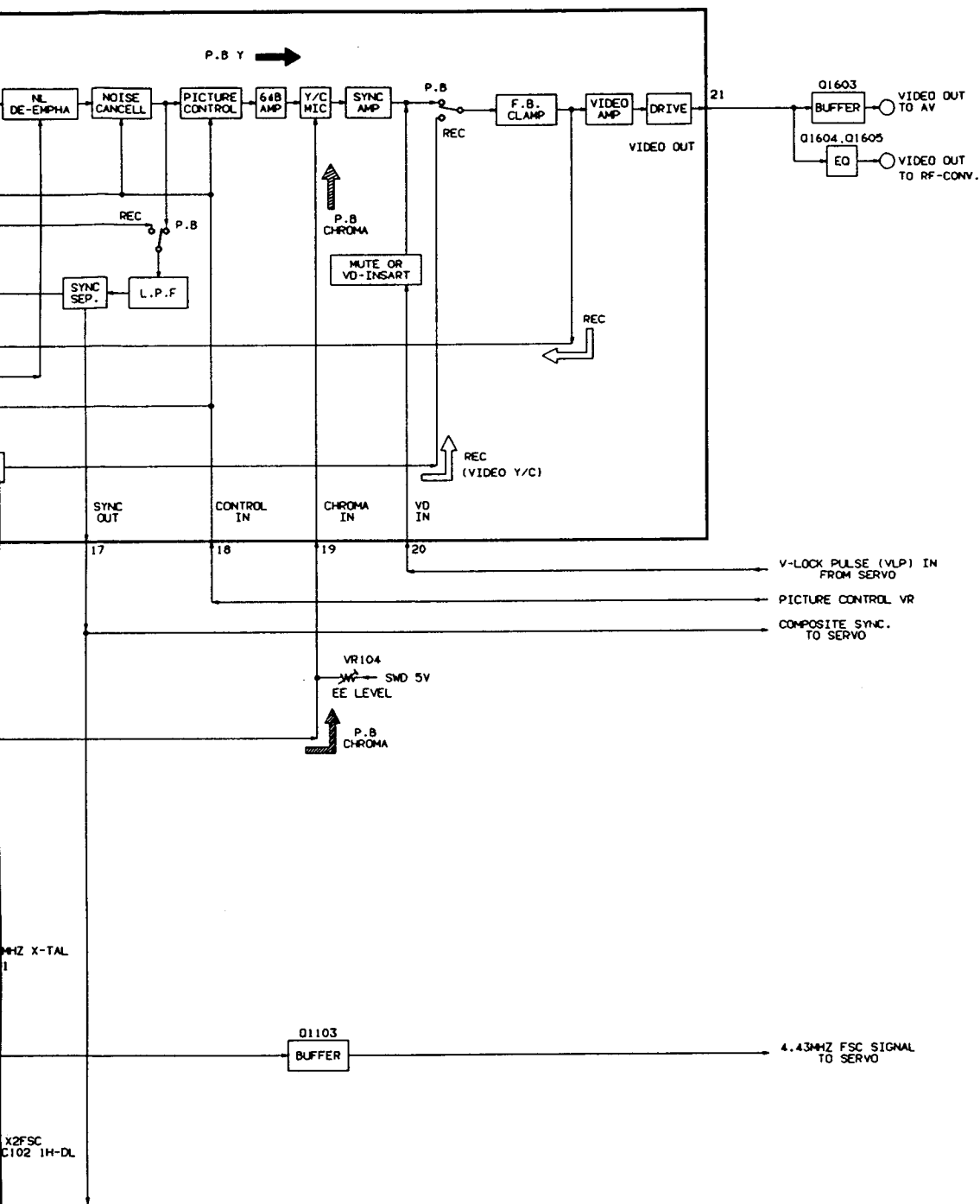
3-3. VIDEO CIRCUIT BASIC BLOCK DIAGRAM



X2FSC



IC102



BDV1-11989/E

16

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18

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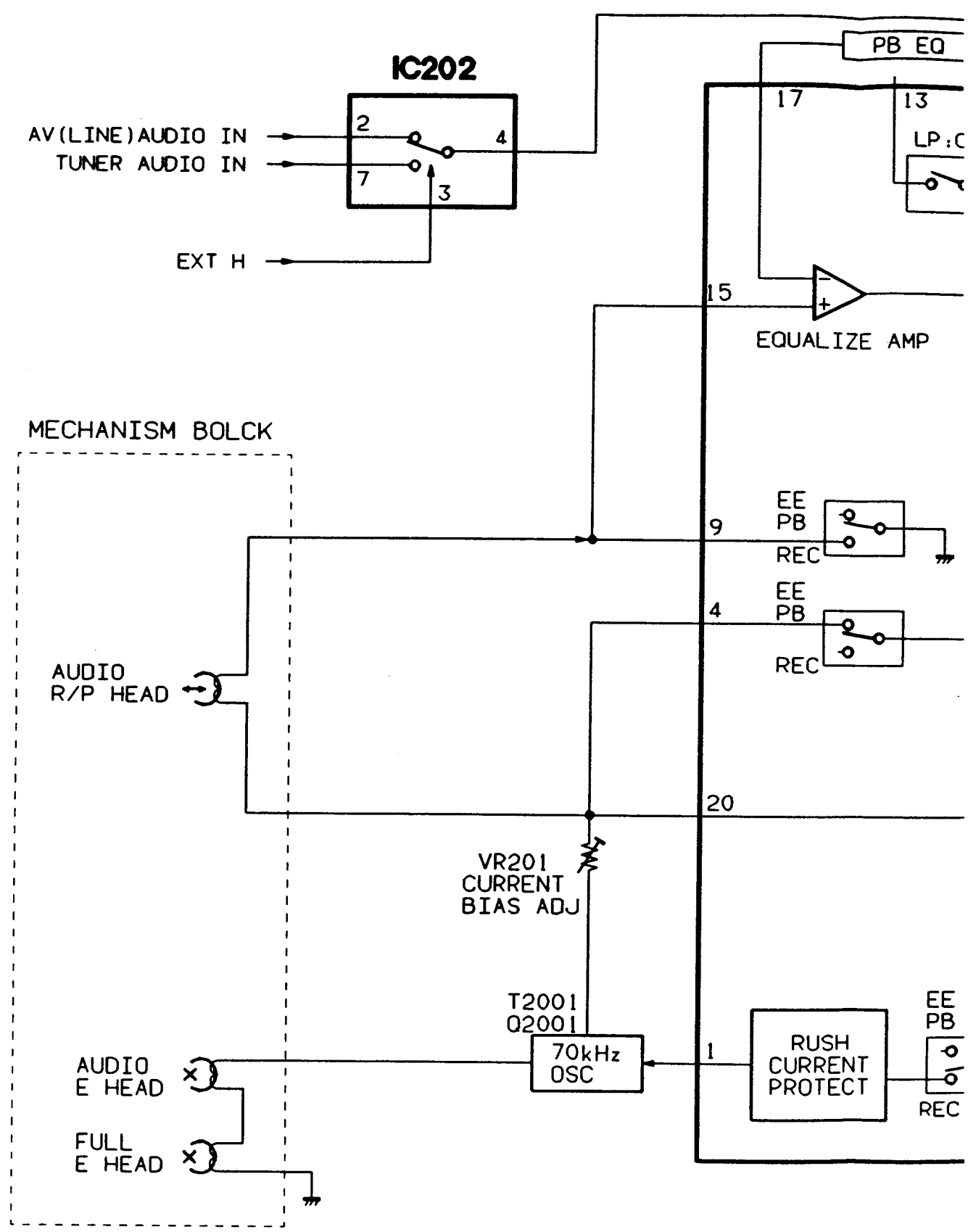
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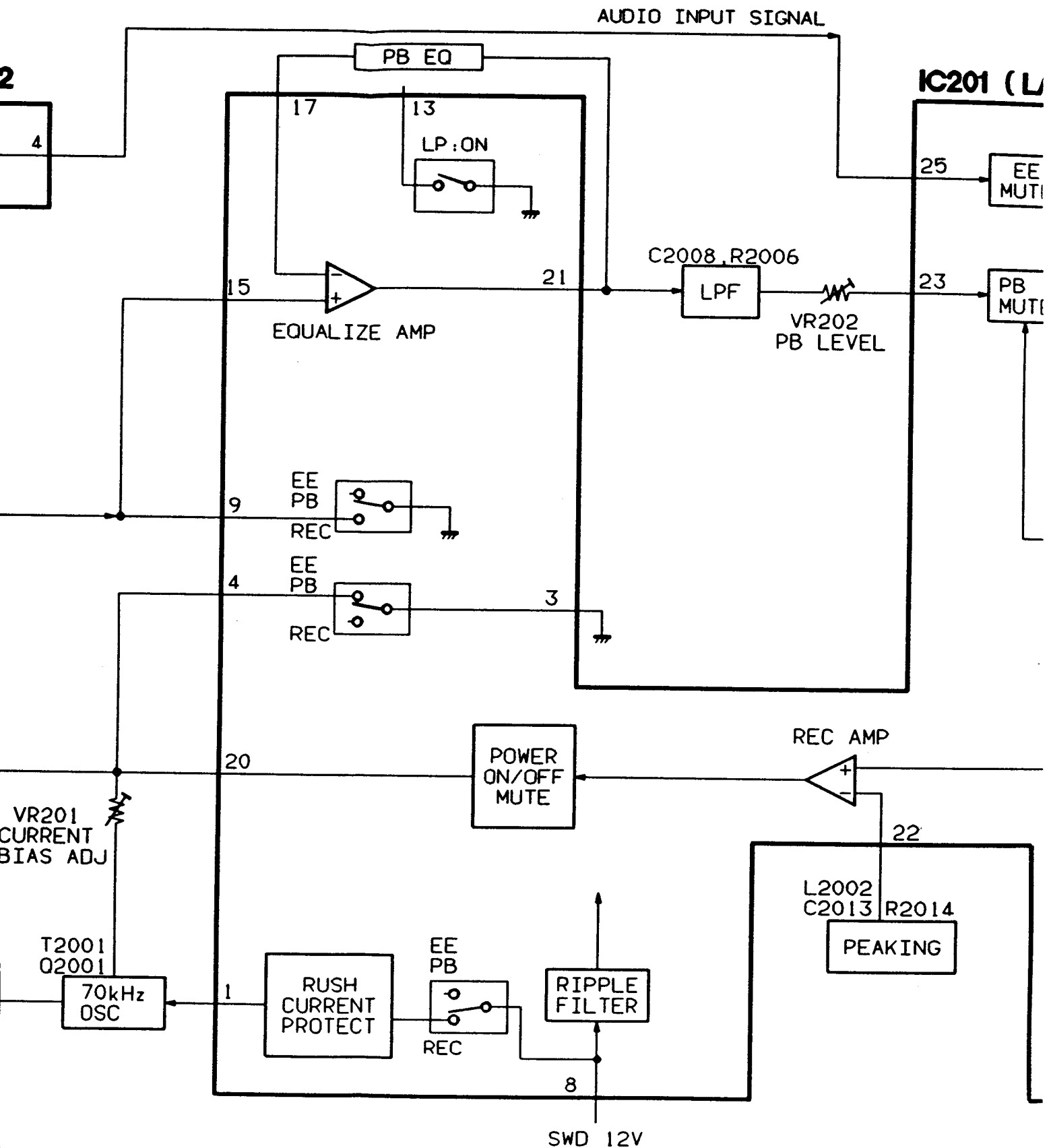
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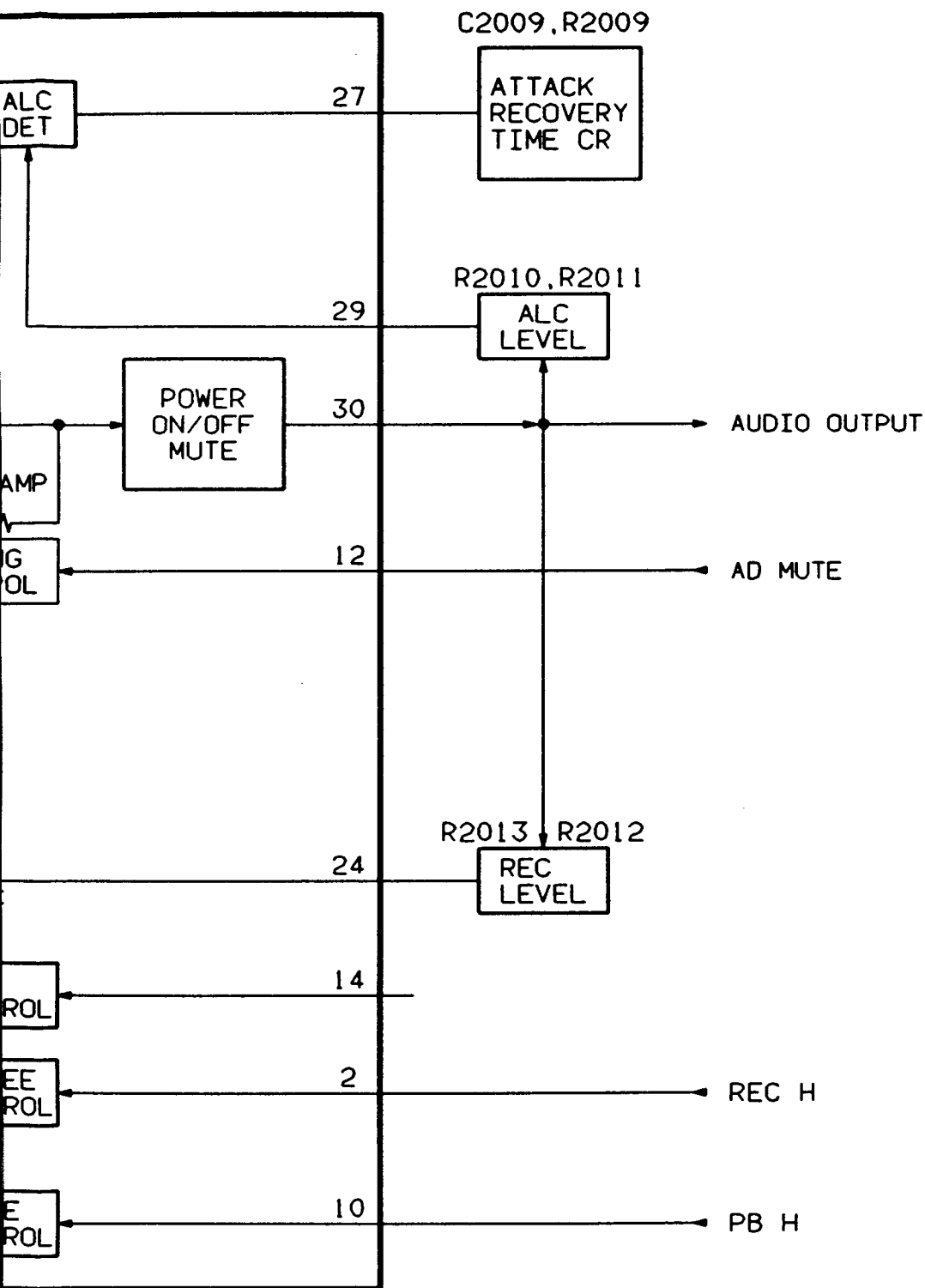
K
J
I
H
G
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D
C
B
A





IO INPUT SIGNAL





BDA1-11946 /EMR

4. MECHANISM MAINTENANCE AND CHECKING

4.1. PERIODIC CHECKING AND MAINTENANCE ITEMS AND SERVICE JIGS

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also, these procedures should always be followed after repairing the unit.

4.1.1. PERIODIC CHECK ITEMS

○ Cleaning ◎ Confirmation △ Lubrication

Part \ Usage Time (hours)		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	Remarks
Tape Guide System	Tape running surfaces	○	○	○	○	○	○	○	○	○	○	
	ACE head	○	○	○	○	○	○	○	○	○	○	
	Drum (cylinder)	○	○	○	○	○	○	○	○	○	○	Head life depends heavily on operating conditions.
Drive System	Loading belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Reel drive belt	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	
	Intermediate gear, pulley axles		△		△		△		△		△	Absolutely avoid oil on tape running surfaces.
	Capstan axles		△		△		△		△		△	
	Loading motor		◎		◎		◎		◎		◎	
Performance Check	Back tension torque		◎		◎		◎		◎		◎	47 ± 5 g-cm
	Brake system		◎		◎		◎		◎		◎	
	FWD, REW, PLAY torque		◎		◎		◎		◎		◎	FWD, REW : 650 g-cm and over PLAY (SP) : 80 to 130 g-cm

4-1-2. CLEANING

- ① Drum (COMPL CYLINDER) and Video Heads (See Fig. 4-1-1.)
 - 1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
 - 2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In Hi-Fi models, clean the audio head also.
 - 3) Clean the tape path surface of the cylinder in the same way.

Note: Always turn power off before cleaning. Never move the chamois leather vertically or apply too much force to the head; it may be damaged.

- ② Cleaning of the Tape Guide System (See Fig. 4-1-2.)

- 1) Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note: Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

- ③ Cleaning of the Drive System

- 1) Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

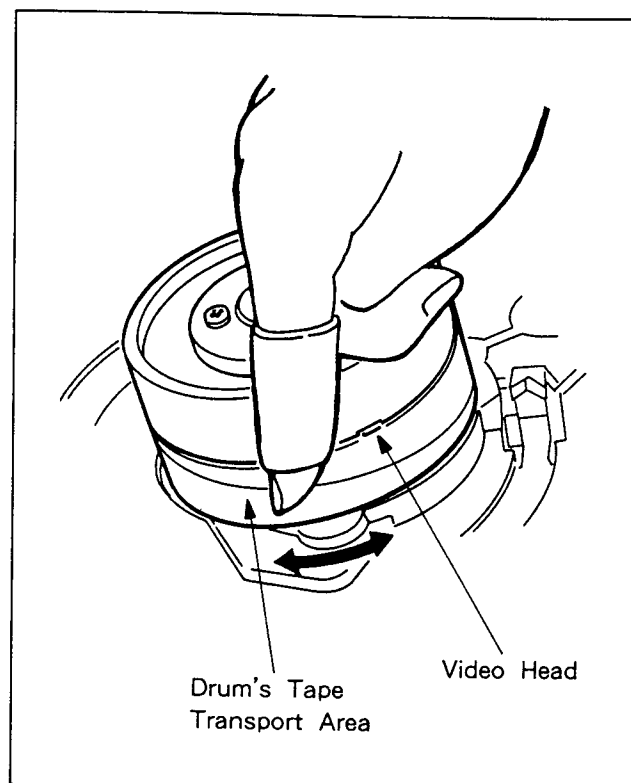


Fig. 4-1-1

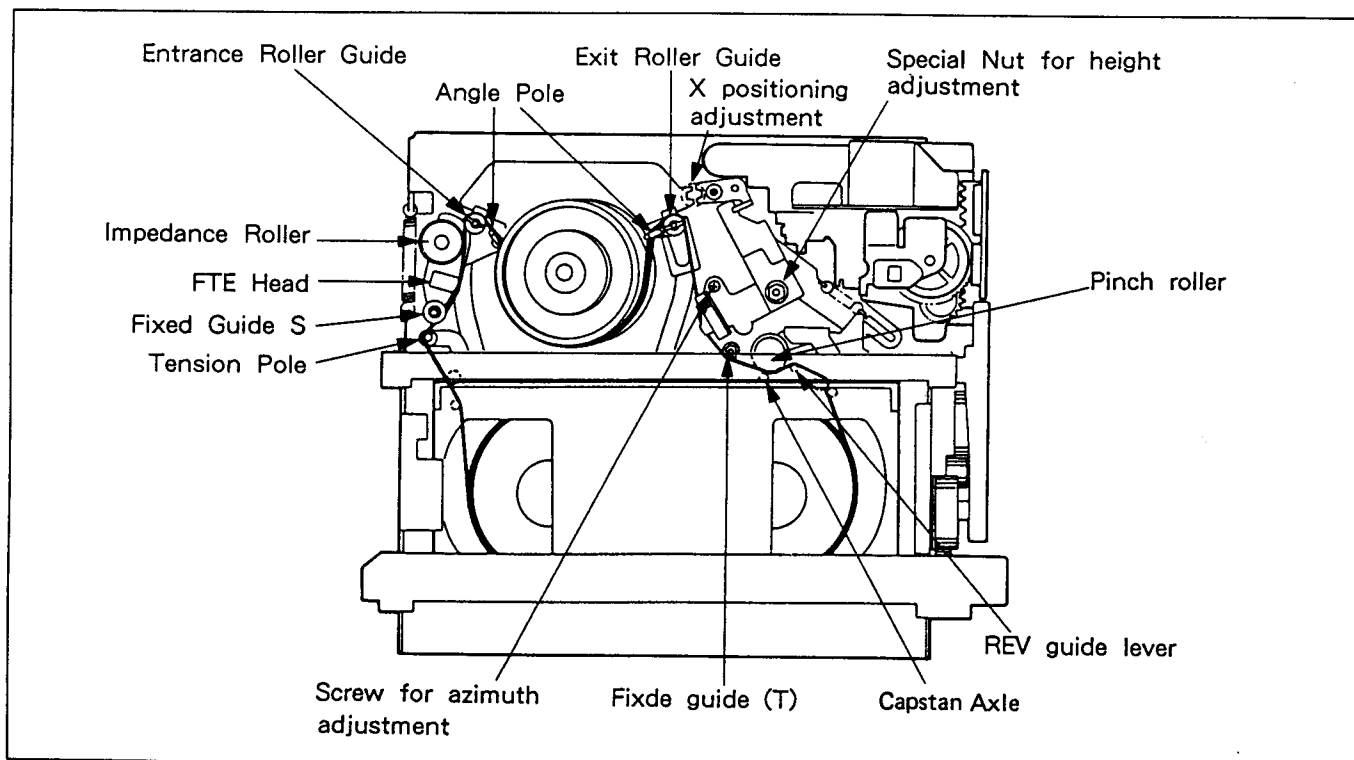
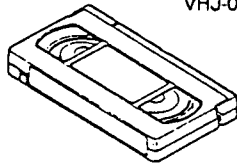
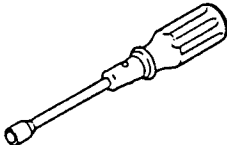
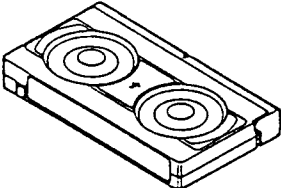
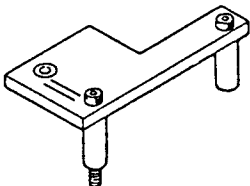
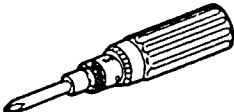
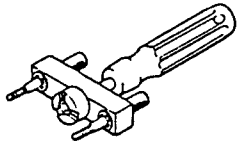
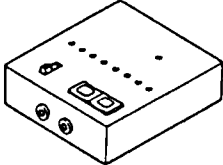
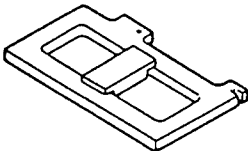
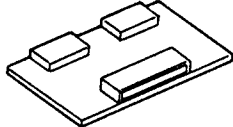


Fig. 4-1-2. Cleaning

4-1-3. SERVICE JIGS

No.	Jig	Jig No.	Remarks
1	Alignment tape	VHJ-0008	SP color bar, 1kHz (normal)
2	Alignment tape	VHJ-0009	SP monoscope, 7kHz (normal)
3	Alignment tape	VHJ-0052	LP monoscope, 3kHz (normal)
4	Eccentric screwdriver	VHJ-0003	For tape path adjustment
5	Nut box	VHJ-0048	For tape path adjustment
6	Torque gauge	VHJ-0004	For reel take-up torque measurement
7	Cassette torquemeter	VHJ-0016	For back tension torque measurement
8	Position adjustment gauge	VHJ-0049	For position adjustment
9	Torque gauge screwdriver	VHJ-0014	For screw fastening torque adjustment
10	3mm dia. bit for torque screwdriver	VHJ-0045	Spare bit for the torque gauge screwdriver
11	Video head removing tool	VHJ-0041	For upper drum removal
12	Mode selector	VHJ-0050	For mechanism mode selection
13	Cassette stand plate gauge	VHJ-0001	For reel height adjustment
14	Fixed guide height gauge	VHJ-0053	For fixed guide (S) height adjustment
15	Mode selector relay jiga	VHJ-0070	For mode selector VHJ-0050
16	Alignment tape	VHJ-0051	For CCD level adjustment

VHJ-0008, VHJ-0009, VHJ-0052, VHJ-0051  No. 1, 2, 3, 16	VHJ-0003  No. 4	VHJ-0048  No. 5	VHJ-0004  No. 6
VHJ-0016  No. 7	VHJ-0049  No. 8	VHJ-0014  No. 9	VHJ-0045  No. 10
VHJ-0041  No. 11	VHJ-0050  No. 12	VHJ-0001  No. 13	VHJ-0053  No. 14
VHJ-0070  No. 15			

4.2. MODE SELECTOR (VHJ - 0050) HANDLING INSTRUCTIONS

The mode selector drives the loading motor of the P88 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT ⇄ REV mode changes.

Instead of the internal batteries, an external DC 6V power supply can also be used.

4.2-1. PART NAMES (See Fig. 4-2-1)

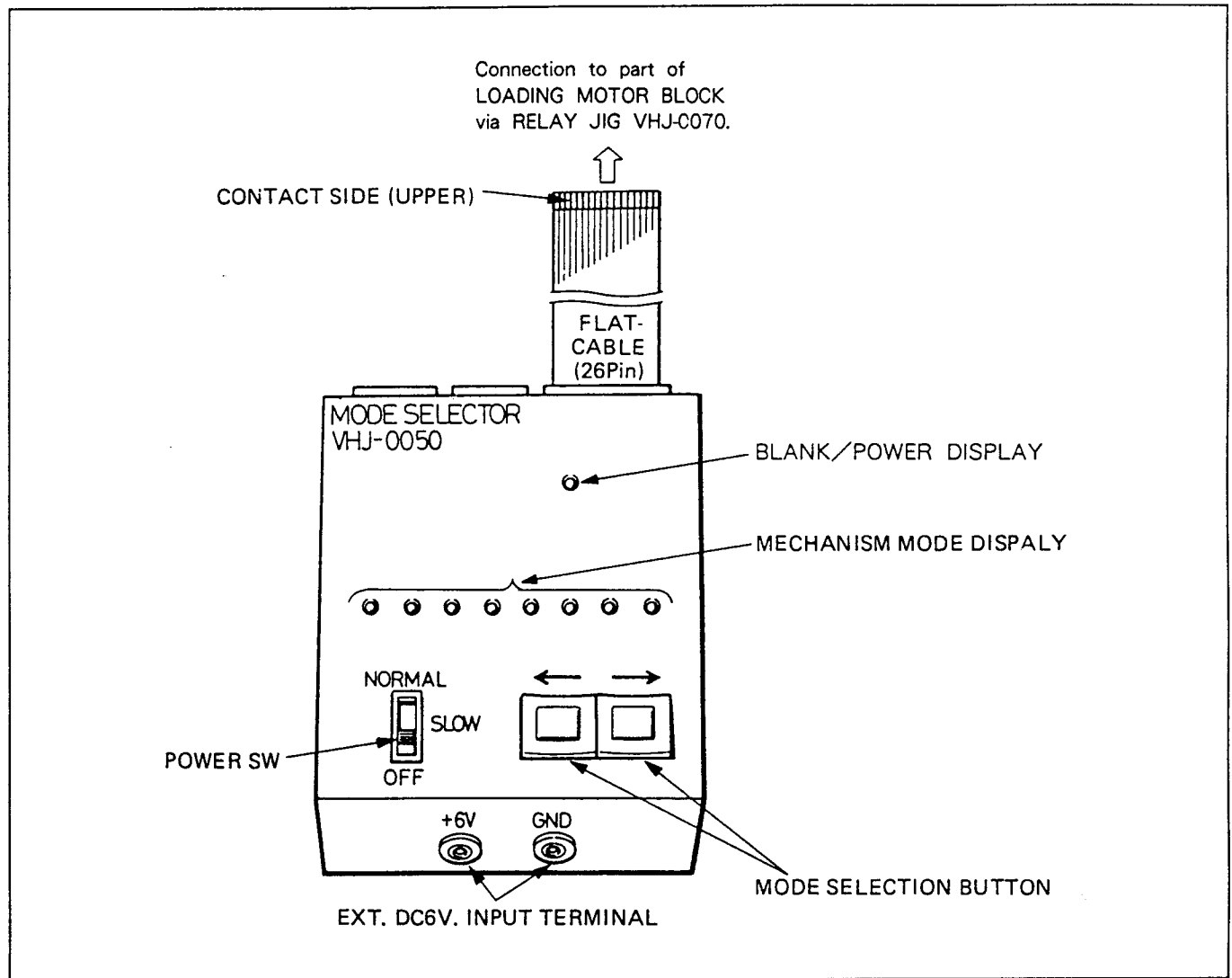


Fig. 4-2-1

4-2-2. CONNECTION METHOD (See Fig. 4-2-2.)

- 1) Remove 14-PIN FLAT CABLE from COMPL MC-2 BOARD CONNECTOR (CN817) from the connector of the system control circuit board, and connect it to 14-PIN CONNECTOR of MODE SELECTOR RELAY JIG VHJ-0070.
- 2) Remove the connector of 6-WIRE CABLE emerging from CASSETTE HOLDER BLOCK from the connector of the system control circuit board, and connect it to 6-PIN CONNECTOR of MODE SELECTOR RELAY JIG VHJ-0070.
- 3) Connect 26-PIN FLAT CABLE supplied with MODE SELECTOR (VHJ-0050) to the selector and to 26-PIN CONNECTOR of RELAY JIG VHJ-0070.

Note: Be sure to connect the proper contact surface of FLEXIBLE FLAT CABLE.

4-2-3. HANDLING

- 1) Keep the right side (⇒) of the mode selector key pressed, and the mode will change in the following sequence: EJECT⇒INITIAL⇒BRAKE⇒STOP/REW/FWD⇒STILL⇒PLAY⇒IDLER⇒REV.
- 2) When changing the mode in the REV⇒EJECT direction, press the Left side (⇐) of the mode selector key until the desired mode is indicated.
- 3) At intermediate positions between modes, the "BLANK" LED lights up (When the mode selector is not connected to the mechanism, the "BLANK" LED indicates that power is on).
- 4) The SLOW position of the POWER switch allows for a slower operation than the NORMAL position.

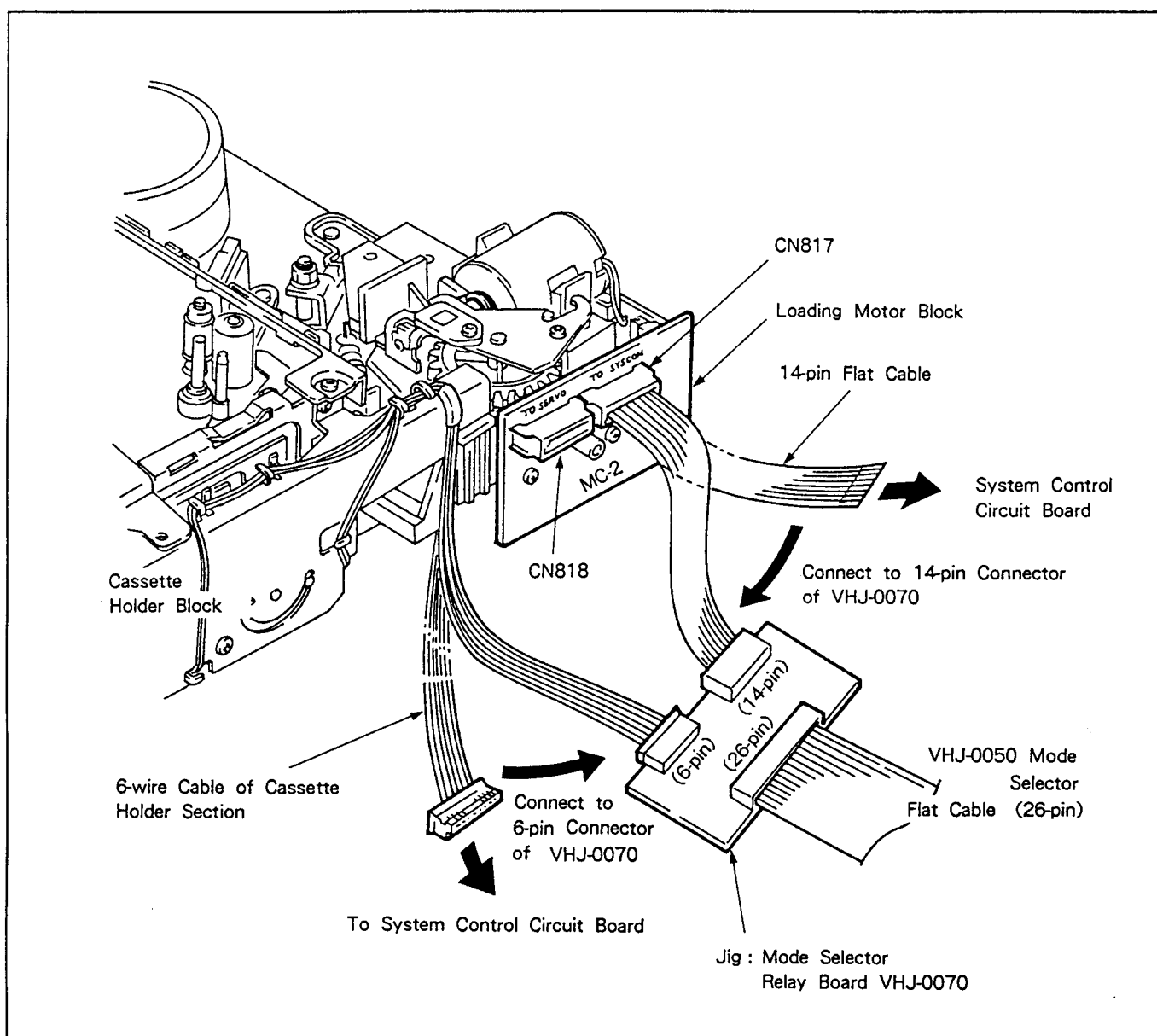


Fig. 4-2-2

Note 1 : The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2 : If the Left side (⇐) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇒) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. As there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇒) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition (Refer to C and B in Fig. 2-3-5 of section 2-3-2. Loading Motor).

When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode indicator lamps (mode EJECT would not be properly indicated during eject).

Sometimes, engagement of the front helical gear with the front worm gear is delayed and operation mode of the mechanism main body gets too much ahead. The front loading mechanism mode cannot be switched to the initial condition. In that case, press the Left side (⇐) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3 : The mode indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

5. MECHANISM ADJUSTMENT

5-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 5-1-1.)

- 1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
- 2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
- 3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode :

Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.

REW/R-SEARCH : After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting into the INITIAL mode after 2 to 3 seconds.

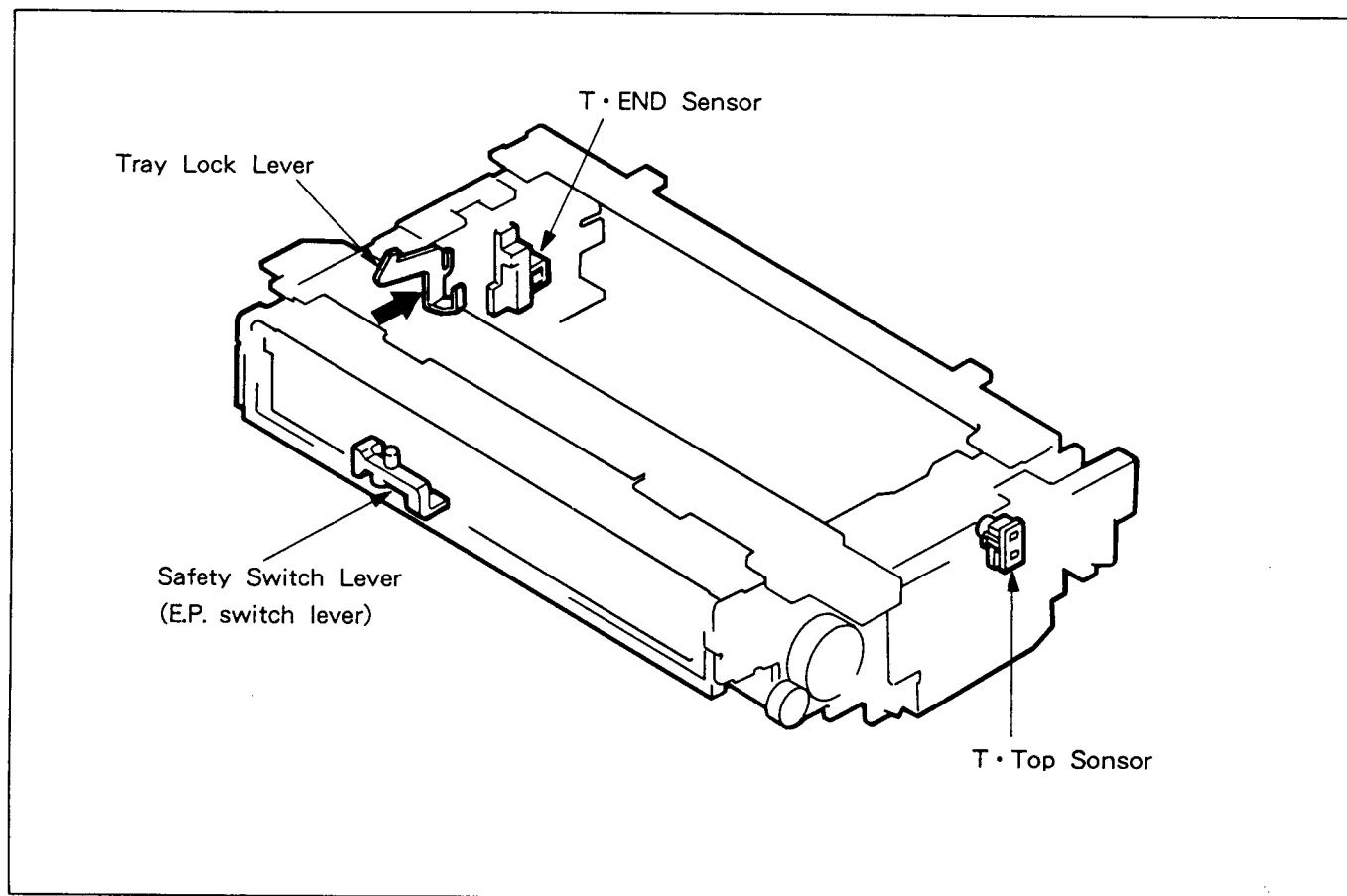


Fig. 5-1-1. Preparations for Adjustment

5.2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

5-2-1. REEL TABLE HEIGHT (See Fig. 5-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is replaced, it will be necessary to adjust the REEL TABLE height.

- (1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- (2) Attach the cassette stand plate gauge (VHJ-0001) and slide the gauge in the direction of the arrows.
- (3) Confirm that, when the gauge stops, the REEL TABLES are not in contact with surface A of the plate and are in contact with surface B.
- (4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.
- (5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.
- (6) Remove the cassette stand plate gauge.
- (7) Set the EJECT mode with the mode selector.
- (8) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.

Note :

- Adjust the reel table height by adding or removing spacers (0.13t, 0.25t, 0.3t, 0.4t and 0.5t) as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
(The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

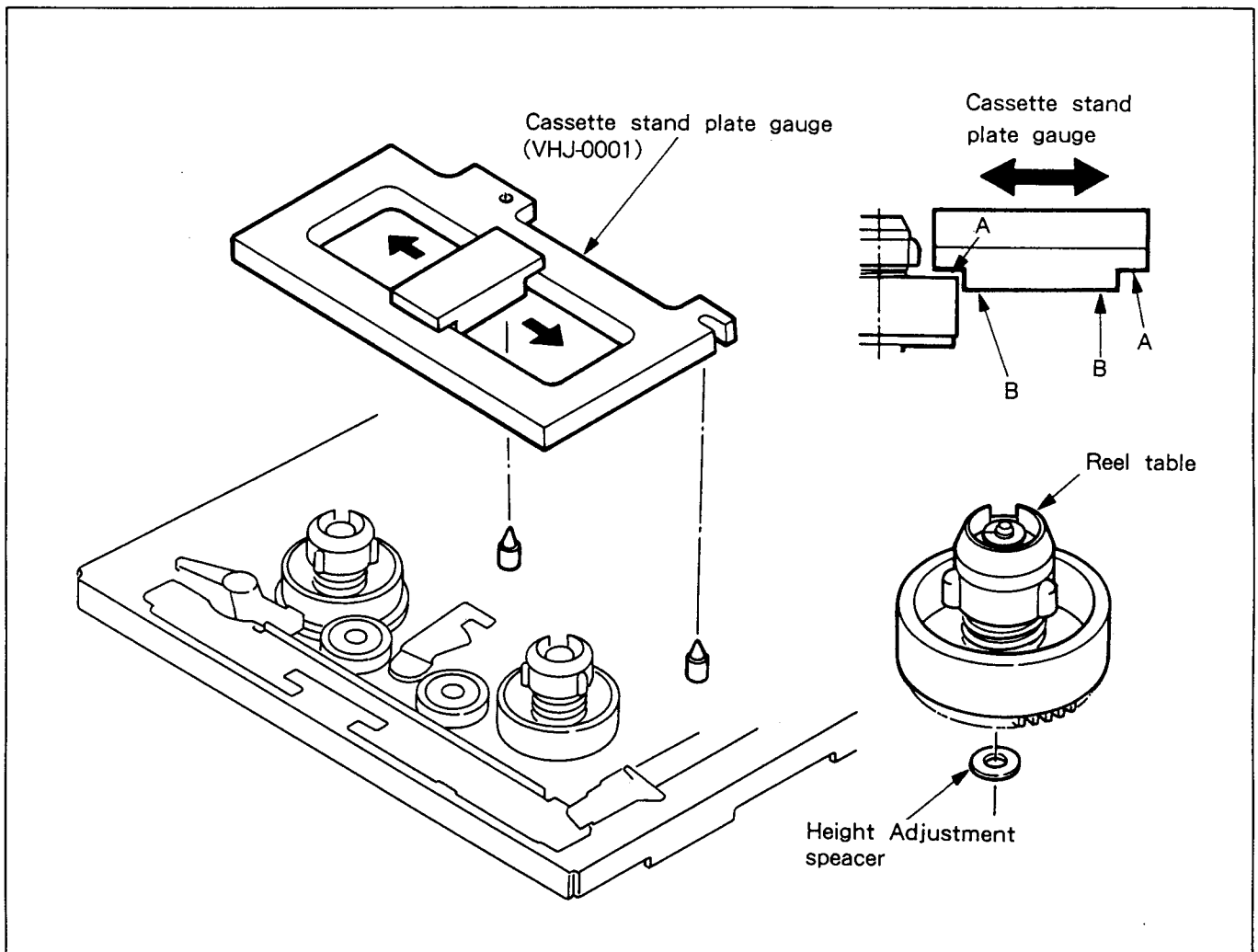


Fig. 5-2-1. Reel Table Height Adjustment

5-2.2. TORQUE CHECK (See Fig. 5-2.2.)

- 1) Set the unit to operating condition without a cassette inserted as instructed in 5-1.
- 2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 600 g-cm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
- 3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600 g-cm or more (locked torque).
- 4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 80 through 150 g-cm (locked torque).

- 5) After confirming that torque readings are within the specifications for each mode, check the following :

- Ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
- Ⓑ Deterioration of the REEL DRIVE BELT.
- Ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
- Ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note : Items Ⓑ, Ⓒ and Ⓓ require replacement if found defective.

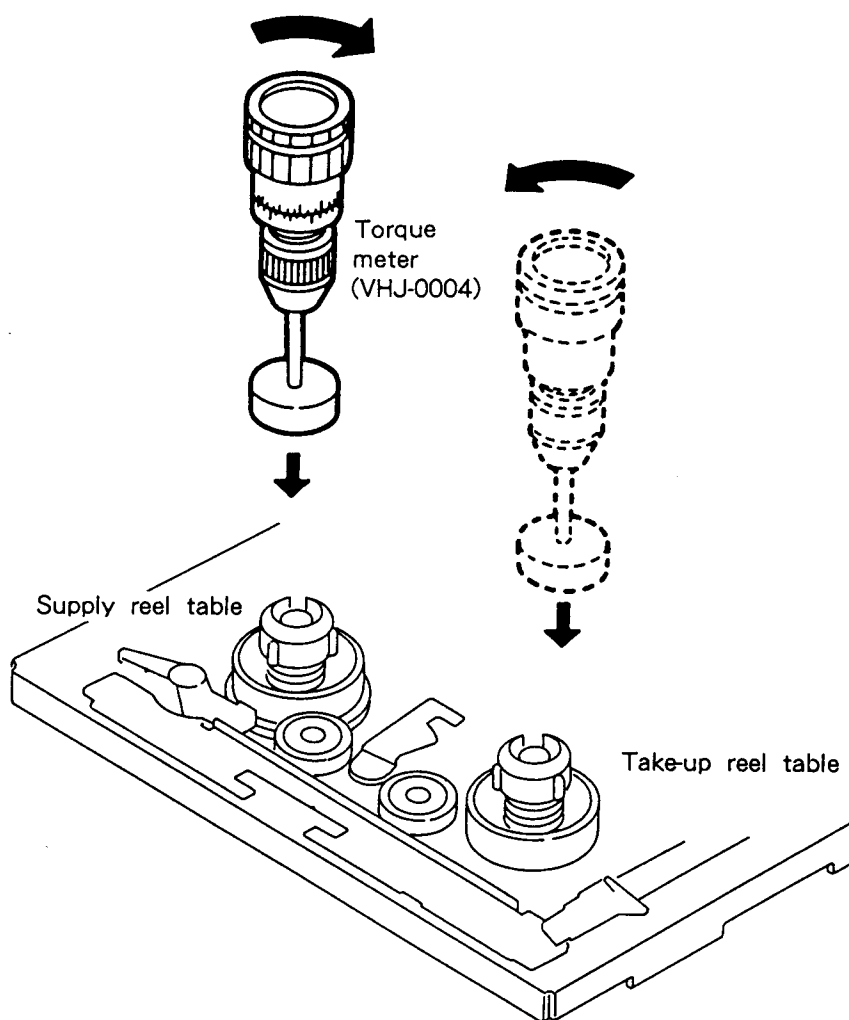


Fig. 5-2.2. Checking REW/FF/PLAY Torque

5-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

5-3-1. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT (See Fig. 5-3.)

- 1) Remove the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 2) Set the PLAY mode with the mode selector (VHJ-0050).
- 3) Attach the position adjustment gauge (VHJ-0049) ①.
- 4) Confirm that the tension pole ② is within the position adjustment gauge frame.
- 5) In case the tension pole is not within the above-mentioned frame, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow A.
- 6) Remove the position adjustment gauge ①.
- 7) Set the EJECT mode with the mode selector.
- 8) Mount the COMPL CASSETTE MECHANISM as instructed in 2-2-1.
- 9) Confirm that back tension torque is within 47 ± 5 g-cm, as instructed in 5-3-2 below.

5-3-2. BACK TENSION TORQUE CHECK (See Fig. 5-3-1.)

- 1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
- 2) Confirm that back tension torque is within 47 ± 5 g-cm.
- 3) In case back tension torque does not meet the above specification, proceed as follows :
 - ① Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.
 - ② Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in 2-7-3.
 - ③ Replace the TENSION LEVER ASS'Y SPRING COIL ⑧.
- 4) Perform the Tension Pole Position Adjustment after performing ①, ② and ③.

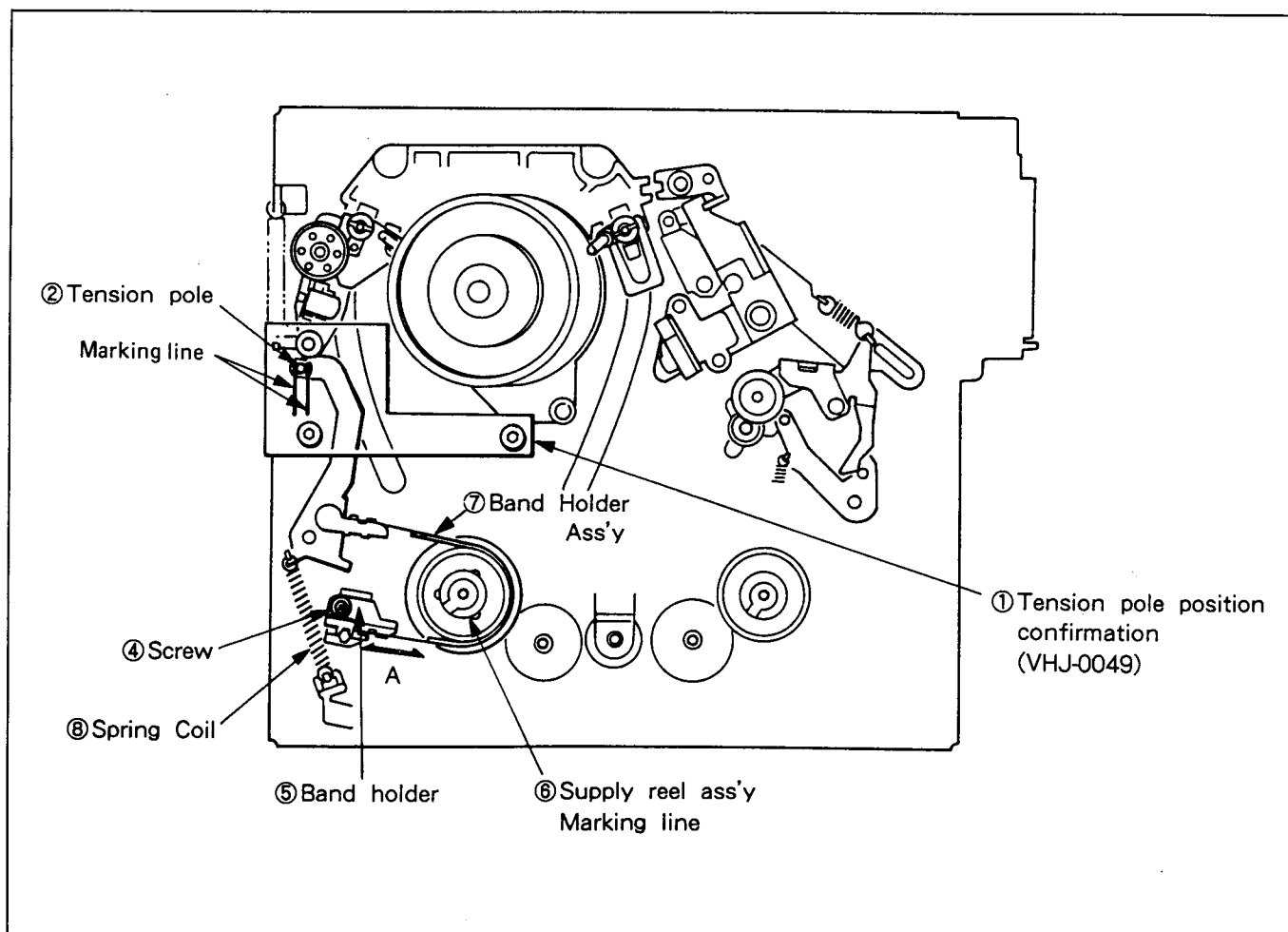


Fig. 5-3. Tension Pole Positioning Adjustment

5.4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 5-4-1.) have been removed or replaced after a long period of use. This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.

Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

5-4-1. PREPARATIONS FOR ADJUSTMENT

- (1) Clean the tape transport surfaces (See Fig. 5-4-1.).
- (2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW25 (RF SW P) test point. During adjustment, apply a trigger to the L side of the SW25 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

Note : Since oscilloscope connection points differ according to the model, refer to the "TEST POINT FOR TAPE PATH ADJUSTMENT" in the section 9 ELECTRICAL CIRCUIT ADJUSTMENT.

- (3) Use a dentist's mirror for visual observation of tape path condition.
- (4) Use a nut box (VHJ-0048) for adjustment of the fixed guides.
- (5) Use an eccentric driver (VHJ-0003) for adjustment of the guide rollers.
- (6) When adjusting height of the fixed guides, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.

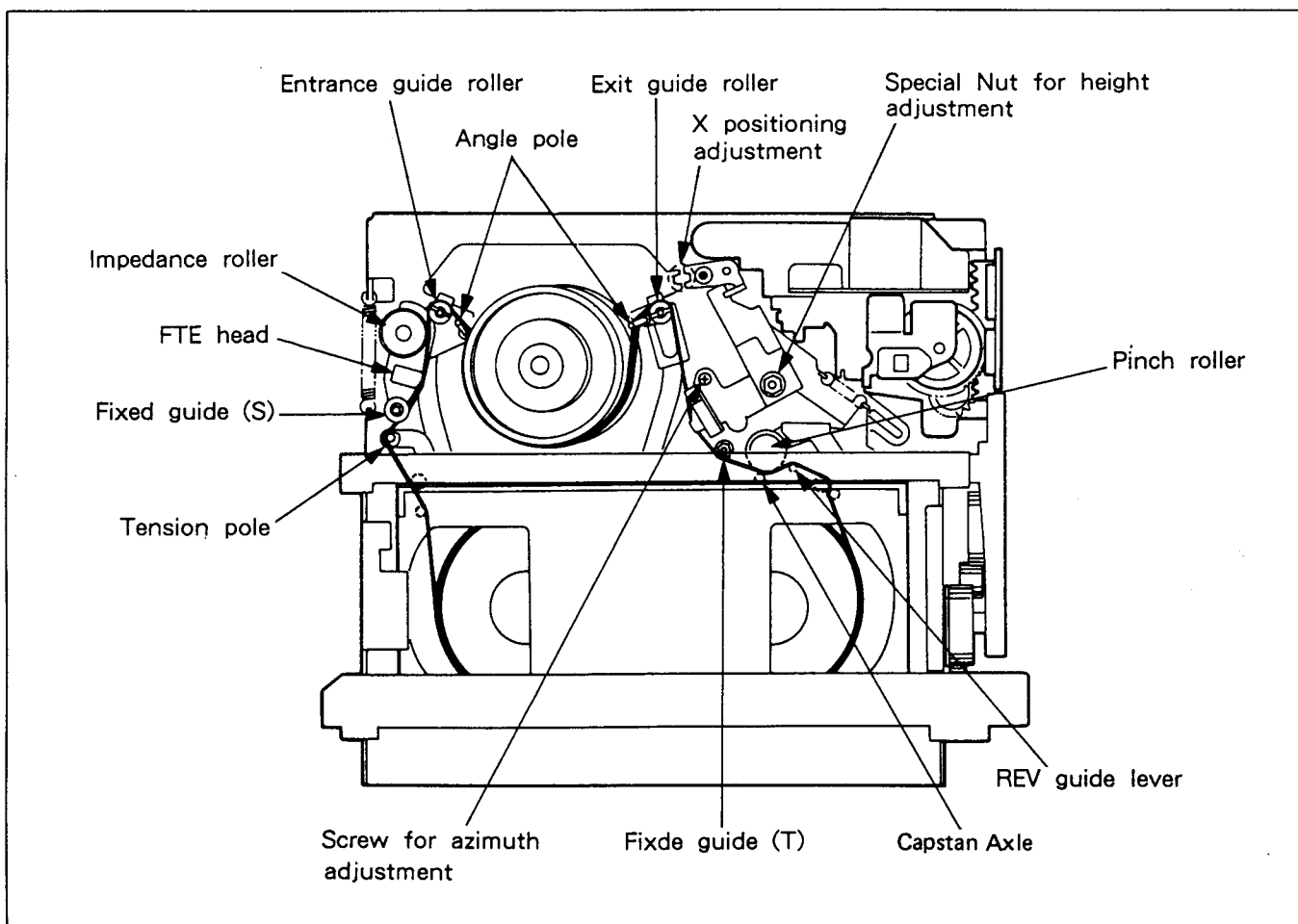


Fig. 5-4-1. Preparation for Adjustment

5-4-2. ADJUSTMENT BY VISUAL OBSERVATION AFTER GUIDE ROLLER, FIXED GUIDE OR COMPL HEAD BRACKET REPLACEMENT

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (VHJ-0009) beforehand and adjust height by visual observation.

(1) Fixed Guides (See Fig. 5-4-2.)

Adjust so that the tape upper edge does not make contact with the fixed guide upper flange, and the tape lower edge does not make contact with the fixed guide lower flange. Gaps A and B should remain equal.

(2) Guide Rollers (See Fig. 5-4-3.)

The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.

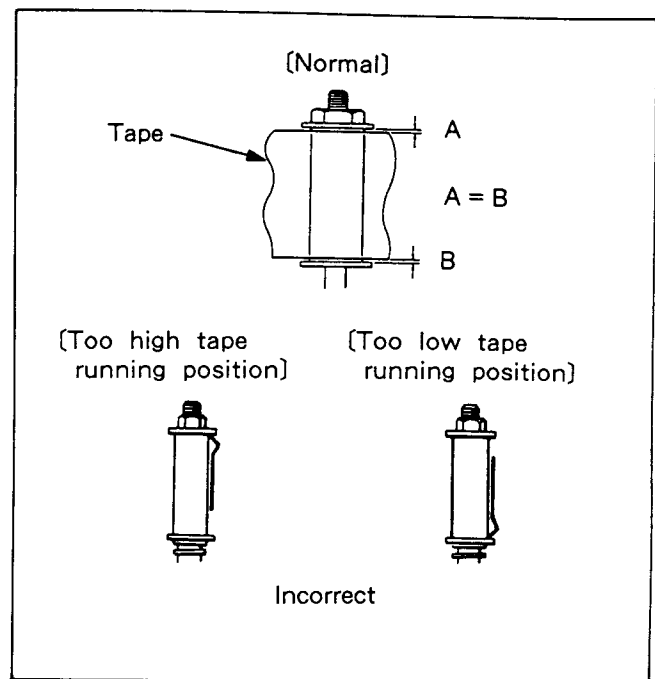


Fig. 5-4-2. (1) Pre-set for Fixed Guide

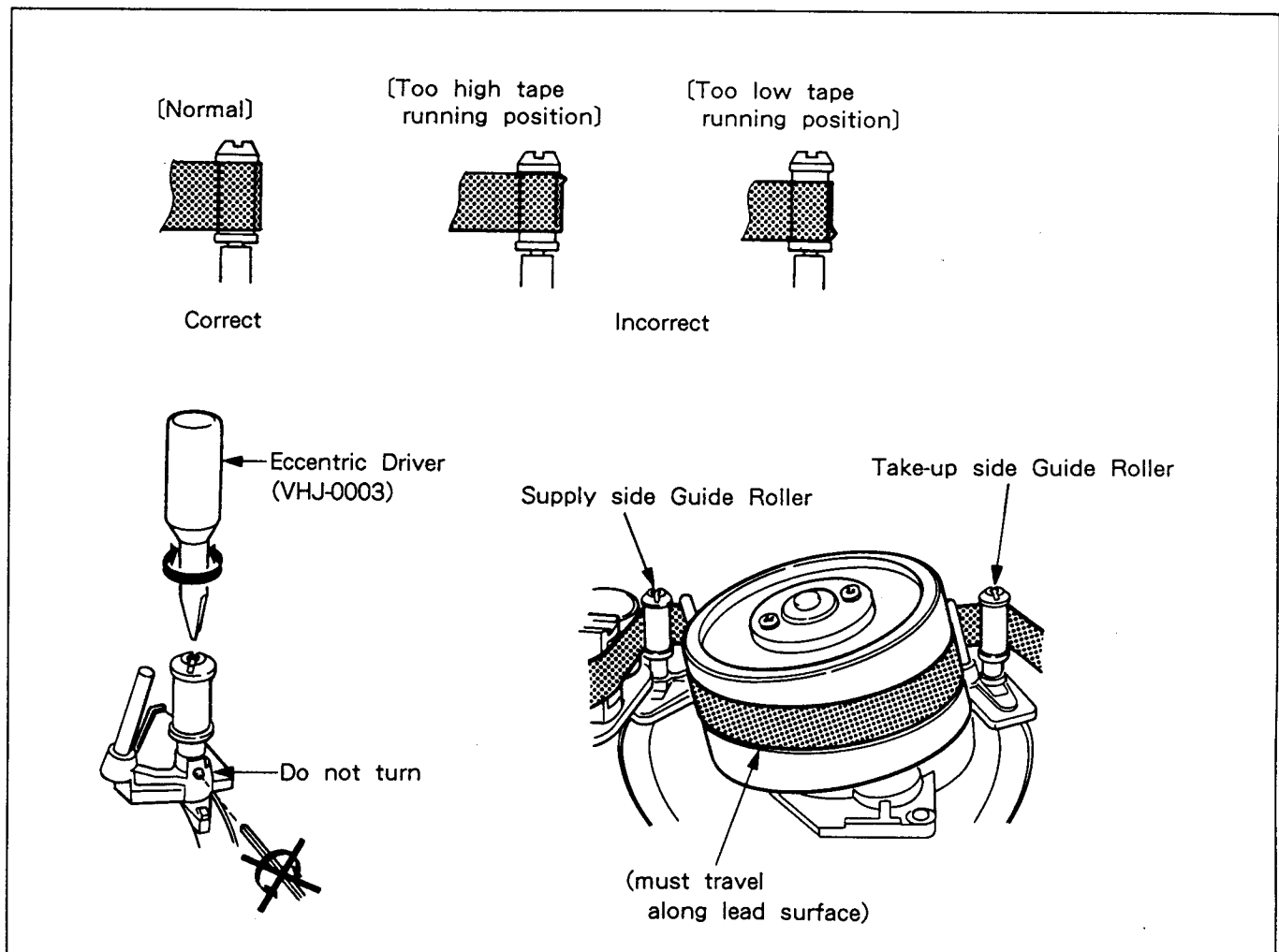


Fig. 5-4-3. (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 5-4-4.)

Adjust the ACE Head Height Adjustment nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut should be touched.

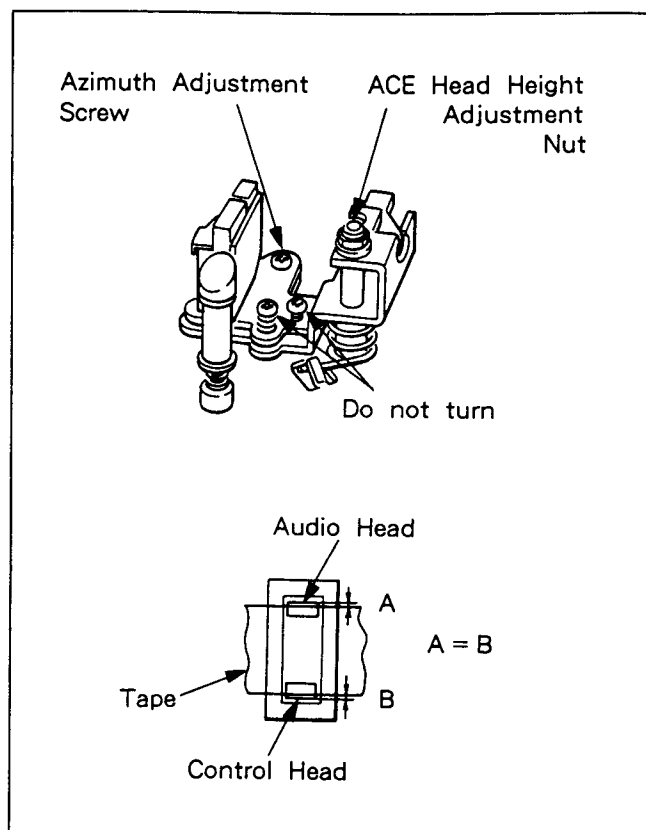


Fig. 5-4-4. (3) Pre-set for Compl Head Bracket

5-4.3. ENTRANCE SIDE FIXED GUIDE (S) HEIGHT ADJUSTMENT (See Fig. 5-4-5.)

- 1) Rotate the fixed guide (S) counterclockwise to lift the tape somewhat, then insert the fixed guide height gage (VHJ-0053) into the lower side of the fixed guide (S) lower flange.
- 2) Rotate the fixed guide (S) special nut clockwise a little at a time until the lower flange makes contact with the upper surface of the fixed guide height gage, causing a slight drag.
- 3) After rotating the special nut 90° counterclockwise, remove the Axed guide height gauge.
- 4) After adjusting the guide rollers in section 5-4-2, play back the alignment tape (VHJ-0009). Confirm that the tape lower edge runs in close contact with the fixed guide (S) lower flange. In case too much pressure has left a gap between the tape and the lower flange, or excessive lifting has caused curling of the tape lower edge, perform fine adjustment. However, do not adjust the special nut beyond 90° clockwise and 45° counterclockwise.

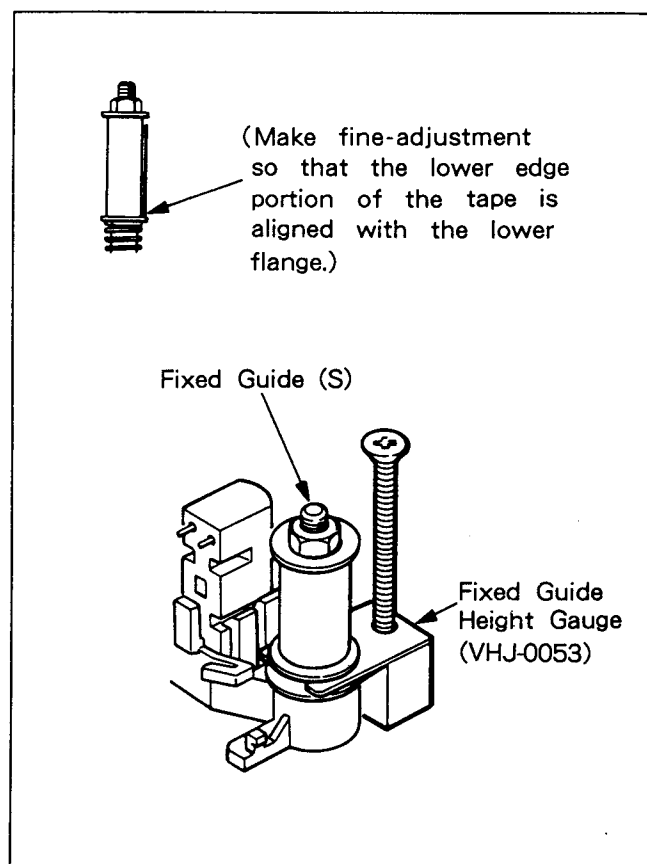


Fig. 5-4-5

5-4-4. GUIDE ROLLER ADJUSTMENT

(See Fig. 5-4-6.)

- 1) Play back the alignment tape (VHJ-0009), press the tracking control key and adjust the envelope waveform to the maximum level.
- 2) Loosen the supply side and take-up side guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until a flat video output waveform is obtained.
- 3) Confirm that the envelope waveform is not deformed. Check visually that no curling occurs at the guide roller upper and lower flanges.

- 4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will, show valleys or peaks at the first half (supply side) or second half (take-up side) if the tape running position is too high or too low.

In case there is unevenness in the first half (supply side), adjust the entrance side guide roller. If the second half (take-up side) shows trouble, adjust finely the take-up side guide roller.

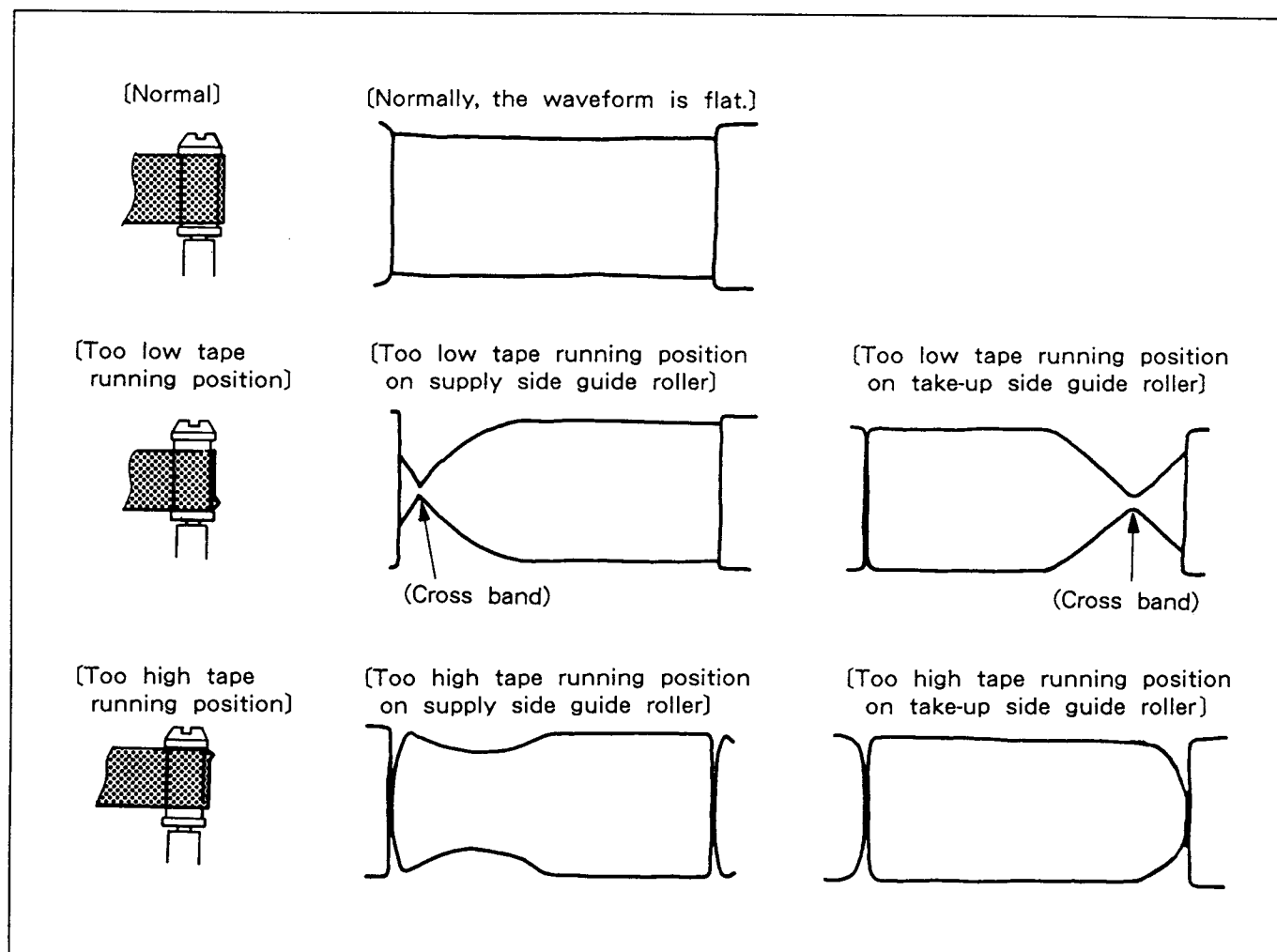


Fig. 5-4-6. Guide Roller Adjustment

5-4-5. EXIT SIDE FIXED GUIDE (T) ADJUSTMENT (See Fig. 5-4-7.)

- 1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
- 2) Rotate the special nut counterclockwise so that the lower flange lifts the tape until its lower edge is slightly curled.
- 3) Rotate the special nut clockwise a little at a time until curling of the tape lower edge is removed.
- 4) Confirm at each mode (PLAY, F.SEARCH, R. SEARCH, F.F and REW) that the tape runs along the lower flange and that no curling occurs.

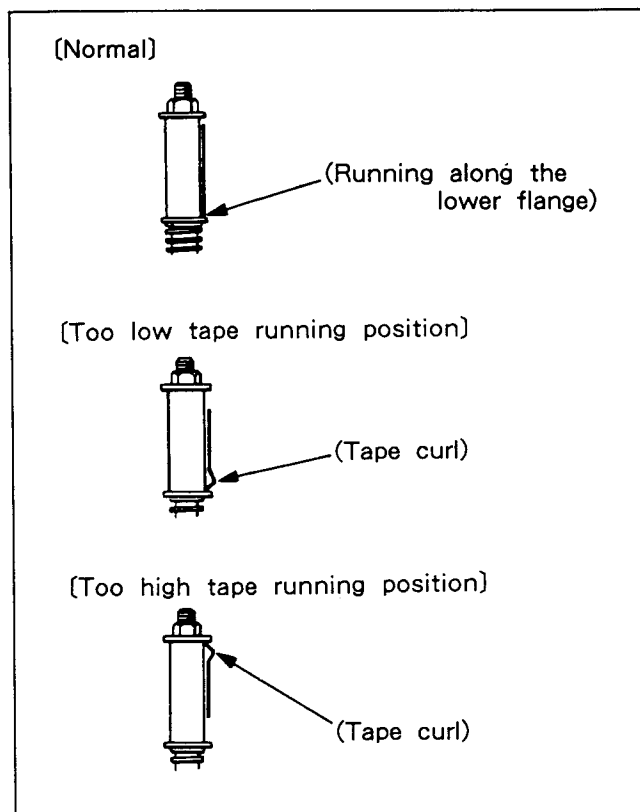


Fig. 5-4-7. Fixed Guide (T)

5-4-6. COMPL HEAD BRACKET (ACE HEAD) ADJUSTMENT

- (1) Height Adjustment and Azimuth Adjustment
(See Fig. 5-4-8.)

- 1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
- 2) Monitor the audio output waveform with the oscilloscope.
- 3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
- 4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
- 5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
- 6) Confirm that the audio output waveform amplitude does not fluctuate.

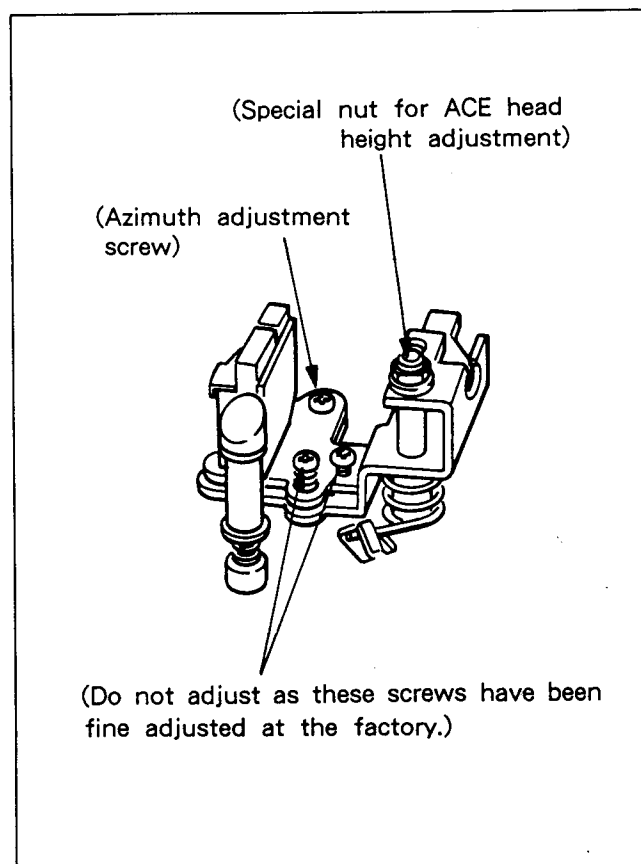


Fig. 5-4-8. Compl Head Bracket

- (2) Tracking (X Value) Adjustment (See Fig. 5-4-9.)
- 1) Load the alignment tape (VHJ-0009) and set the PLAY mode.
- 2) Set tracking to the center position with the tracking control key (See Note below).
- 3) Rotate the stopper bracket fixing screw 180° counterclockwise.
- 4) Monitor the video head output envelope waveform with the oscilloscope.
- 5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (-) tracking control keys.
- 6) Tighten the fixing screw.
- 7) Perform servo circuit channels 1/2 switching position adjustment (refer to Electrical Adjustment).

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, -) and observe the front panel clock display. It will read "T - : -" at the tracking center, "T - : , T - - : " when keeping the minus (-) key pressed, and "T : -, T : - -" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

5-4-7. CHECKING AFTER ADJUSTMENT

- 1) Play back the alignment tape (VHJ-0009) and confirm that the envelope waveform rise immediately, and that there is no fluctuation in the envelope and audio output waveforms.
- 2) Load an E-180 cassette, record it and play it back. Then, confirm again that the envelope waveform rise immediately, and that there is no fluctuation in the envelope and audio output waveforms (during recording, input a 1kHz signal to the audio input terminals. Be sure to use an unspooled E-180 cassette).

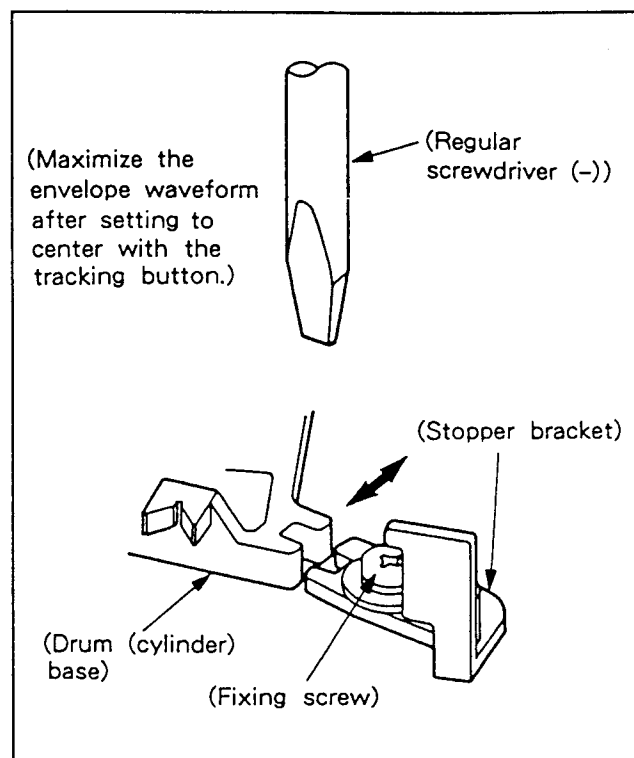


Fig. 5-4-9

- 3) Set the PLAY mode, then turn power OFF (INITIAL mode) and set the PLAY mode again. Confirm that the envelope waveform rise immediately. Also check that the tape is not bent around the pinch rollers.
- 4) Confirm that the envelope waveform rise immediately, after changing from the FF, REW, F.SEARCH and R.SEARCH modes into PLAY. Also check that the tape is not bent around the pinch rollers.
- 5) Confirm that no tape curling or sliding-up occurs at the upper and lower flanges of the tape guides in the PLAY, FF, REW, F.SEARCH and R. SEARCH modes.
- 6) In the PLAY mode, confirm that the tape runs as shown in Fig. 5-4-10.

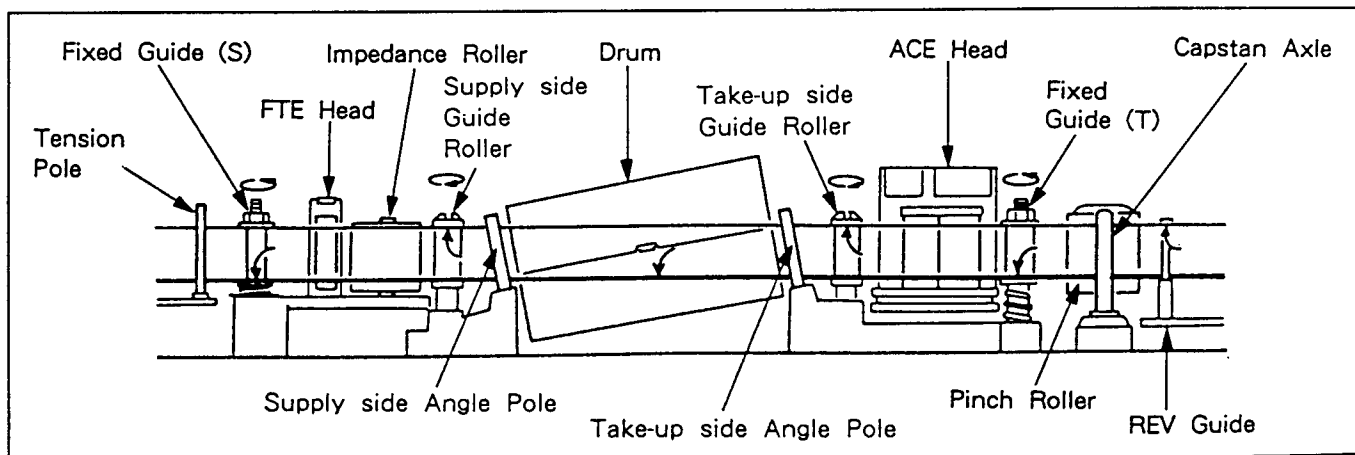


Fig. 5-4-10

6. ELECTRICAL ADJUSTMENT

6-1. PREPARATION

6-1-1. EQUIPMENT

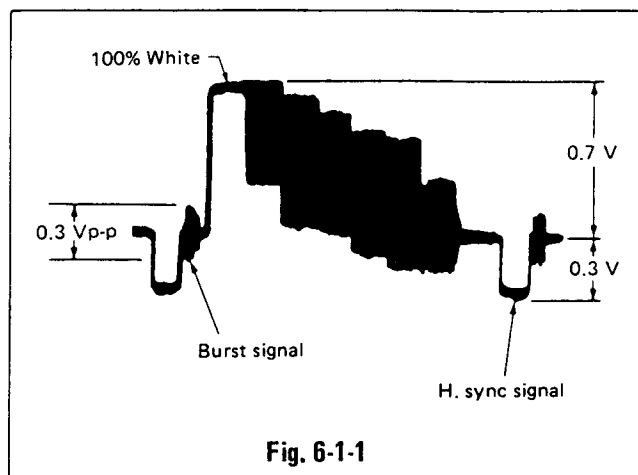
- Colour TV monitor
- PAL Colour-bar generator (with RF and LINE OUTPUT)
- Audio frequency oscillator
- Oscilloscope (dual trace; frequency response: 10MHz or more; probe: 10:1)
- Frequency counter (countable to 10MHz or higher)
- Digital voltmeter
- AC voltmeter
- In/output probes

- Alignment cassette (VHJ-0008) Colour bar 1KHz
- Alignment cassette (VHJ-0009) Monoscope 6KHz
- Alignment cassette (VHJ-0051) Check for D.O.C.
- Alignment cassette (VHJ-0023) PAL Monoscope 6KHz, PAL Colour-bar 1KHz, SECAM Colour-bar 1KHz, PAL RF Sweep MESECAM Colour-bar 1KHz, NTSC Colour-bar 1KHz.

6-1-2. SET-UP

Because the RF input signal is used for circuit adjustments, connect the colour-bar generator to the ANT IN terminal of the VCR. The RF input signal is processed by the tuner and IF circuit. It is important that the video output signal of the IF circuit satisfies the items shown in Fig. 6-1-1. Connect the oscilloscope to the VIDEO OUTPUT terminal (TP161 or CN161 pin 19) of the video circuit and terminate with 75Ω load, and then check the video output signal.

- The amplitude of the sync signal should be approximately 0.3 Vp-p.
- The amplitude of the video signal should be approximately 0.7 Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the colour burst amplitude is approximately 0.3 Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.



6-2. SERVO CIRCUIT ADJUSTMENT ... CP-1 PCB

NOTE (1): These adjustments should be carried out upon completion of the tape transport adjustments.

(2): If the tape transport adjustments are carried out after these adjustments, follow the procedures again in SWITCHING POSITIONS.

No.	Item	Input	Mode	Point	Location	Remark
1	SWITCHING POSITION	Alignment cassette (VHJ-0009 or VHJ-0023)	PLAY	VIDEO OUTPUT TP161 or CN161 pin 19 CN359 pin 1 (trigger)	VR351	1. Set the tracking control to the center position (on the display "T - : -"). 2. Adjust VR351 so that the phase of the leading edge of the vertical sync signal is delayed 6.5 ± 0.5 H from the fall of the RF switching pulse waveform.

No.	Item	Input	Mode	Point	Location	Remark
2	STILL V-LOCK	Colour bar from Colour bar generator	REC ↓ PLAY ↓ STILL	TV screen	VR358 (Rear panel)	1. Playback the recorded part, and put the VCR in the STILL mode. 2. Adjust VR358 so that the V jitter (very fine movement of the vertical sync) is minimized.

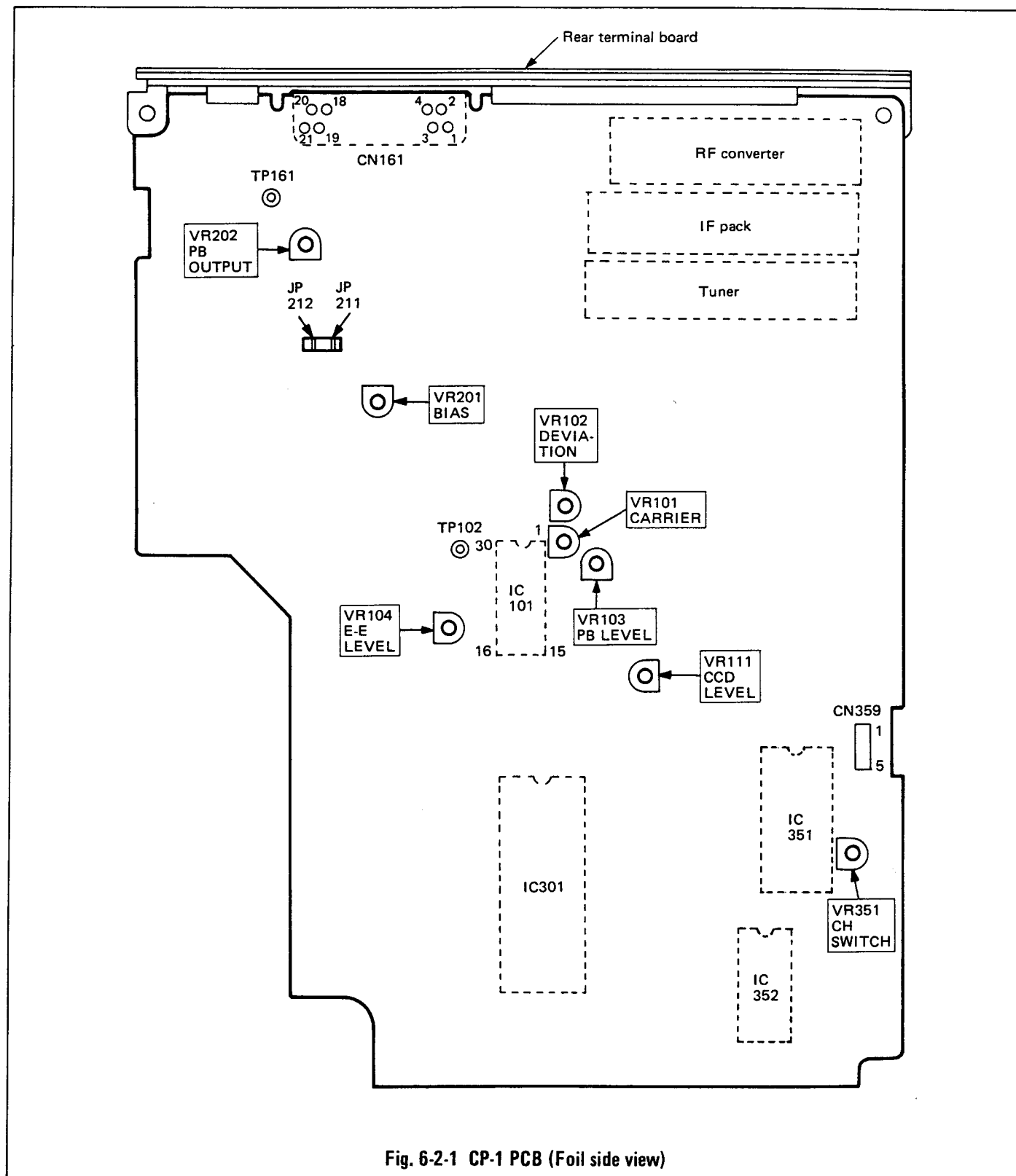


Fig. 6-2-1 CP-1 PCB (Foil side view)

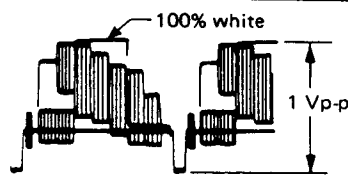
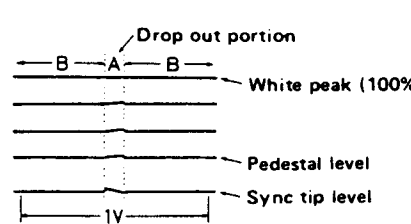
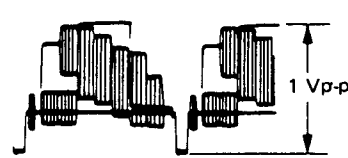
6-3. VIDEO CIRCUIT ADJUSTMENT... CP-1 PCB and VP-1 ASSY

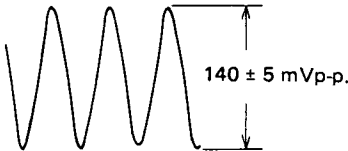
NOTE (1): When adjusting No. 1, No. 2 and No. 5 below, terminate VIDEO OUTPUT terminal (CN161 pin 19) at 75 ohms.

(2): To make this adjustment, alternately make the adjustments described in No. 4 and No. 5 below.

Repeat this procedure until both adjustment values are satisfied.

(3): 'No-signal REC mode' is not to supply any signal to VIDEO INPUT terminal (CN161 pin 20).

No.	Item	Input	Mode	Point	Location	Remark
1	E-E LEVEL NOTE(1)	Colour bar (100% white level) from Colour bar generator	E-E	VIDEO OUTPUT TP161 or CN161 pin 19 (CP-1 PCB)	VR104	 Adjust VR104 so that the level is 1.00 ± 0.05 Vp-p.
2	PLAYBACK LEVEL NOTE(1)	Alignment cassette (VHJ-0008 or VHJ-0023)	PLAY	VIDEO OUTPUT TP161 or CN161 pin 19 (CP-1 PCB)	VR103	 Adjust VR103 so that the level is 1.00 ± 0.05 Vp-p.
3	CCD LEVEL	Alignment cassette (VHJ-0051)	PLAY	VIDEO OUTPUT TP161 or CN161 pin 19 (CP-1 PCB)	VR111	 - Set the horizontal scale (TIME/DIV) of the oscilloscope to 1 msec./div.. - Adjust VR111 so that the drop out portion "A" of white peak (100%) and other portion "B" are same level.
4	CARRIER SET NOTE(2),(3)	No-signal	REC	TP102 or IC101 pin 30 (CP-1 PCB)	VR101	- Set the channel selector buttons to the AV position and put the VCR in the no-signal REC mode. - Adjust VR101 so that the frequency is 3.85 ± 0.05 MHz.
5	DEVIATION NOTE(1), (2)	Colour bar (100% white level) from Colour bar generator	REC (Adjust- ment) ↓ PLAY (Check)	VIDEO OUTPUT TP161 or CN161 pin 19 (CP-1 PCB)	VR102	 - Playback the recorded part, and check that the level is 1.00 ± 0.05 Vp-p. - If the level is not 1.00 ± 0.05 Vp-p, adjust VR102 until the value is satisfied.

No.	Item	Input	Mode	Point	Location	Remark
6	CHROMINANCE SIGNAL RECORDING CURRENT	Colour bar from Colour bar generator	REC	TP181 (HOT) shield case (GND) (VP-1 ASSY)	VR182	 $32 \pm 2 \text{ mVp-p}$ 1. Rotate VR181 clockwise fully to the minimum level. 2. Adjust VR182 so that the level is $32 \pm 2 \text{ mVp-p}$.
7	LUMINANCE SIGNAL RECORDING CURRENT NOTE(3)	No-signal	REC	TP181 (HOT) shield case (GND) (VP-1 ASSY)	VR181	 $140 \pm 5 \text{ mVp-p}$ 1. Set the channel selector buttons to AV position and put the VCR in the no-signal REC mode. 2. Adjust VR181 so that the level is $140 \pm 5 \text{ mVp-p}$.

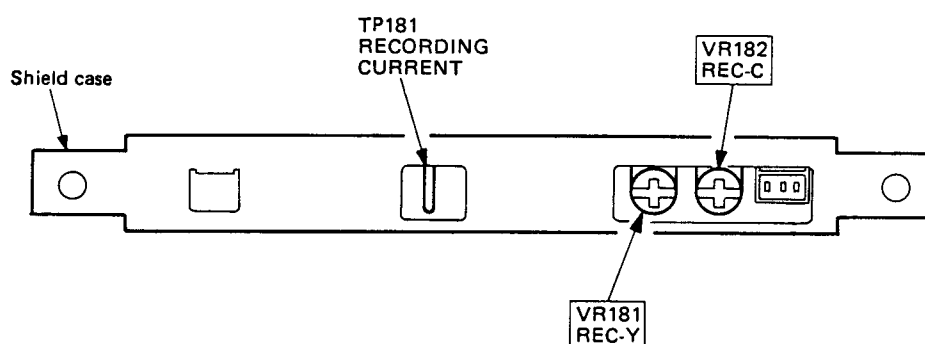


Fig. 6-3-1 VP-1 ASSY

6-4. AUDIO CIRCUIT ADJUSTMENT... CP-1 PCB

NOTE : 'No-signal record mode' is not to supply any signal to AUDIO INPUT terminal (CN161 pin 2, 6).

No.	Item	Input	Mode	Point	Location	Remark
1	BIAS	No-signal	REC	JP212 JP211(GND)	VR201	1. Set the channel selector buttons to the AV position and put the VCR in the no-signal REC mode. 2. Adjust VR201 so that the level is 22 mVp-p.
2	PLAYBACK OUTPUT LEVEL	Audio signal (1 KHz, -3.8 dBs) from Audio signal generator	REC ↓ PLAY	AUDIO OUTPUT CN161 pin 1 AUDIO INPUT CN161 pin 2	VR202	Adjust VR202 so that the recorded 1 KHz output level becomes -3.8 dBs in the PLAY mode.

6-5. TUNER IF CIRCUIT ADJUSTMENT... IF Pack

NOTE: Remove the rear terminal board from the CP-1 assembly before adjusting the IF pack (see Fig. 6-2-1)

No.	Item	Input	Mode	Point	Location	Remark
1	RF AGC	TV broadcast	E-E	TV screen	VR611	1. Turn VR611 in the direction which causes snow to appear, then in the opposite direction until the snow just disappears.

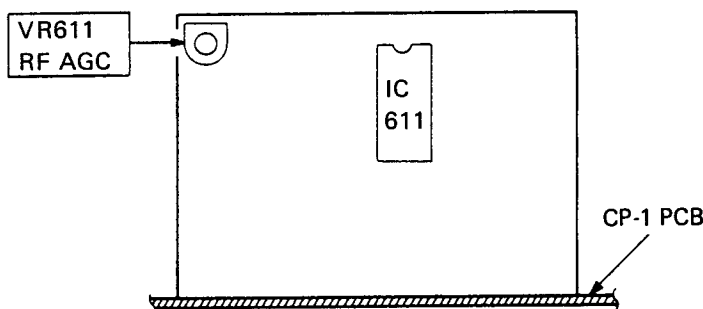
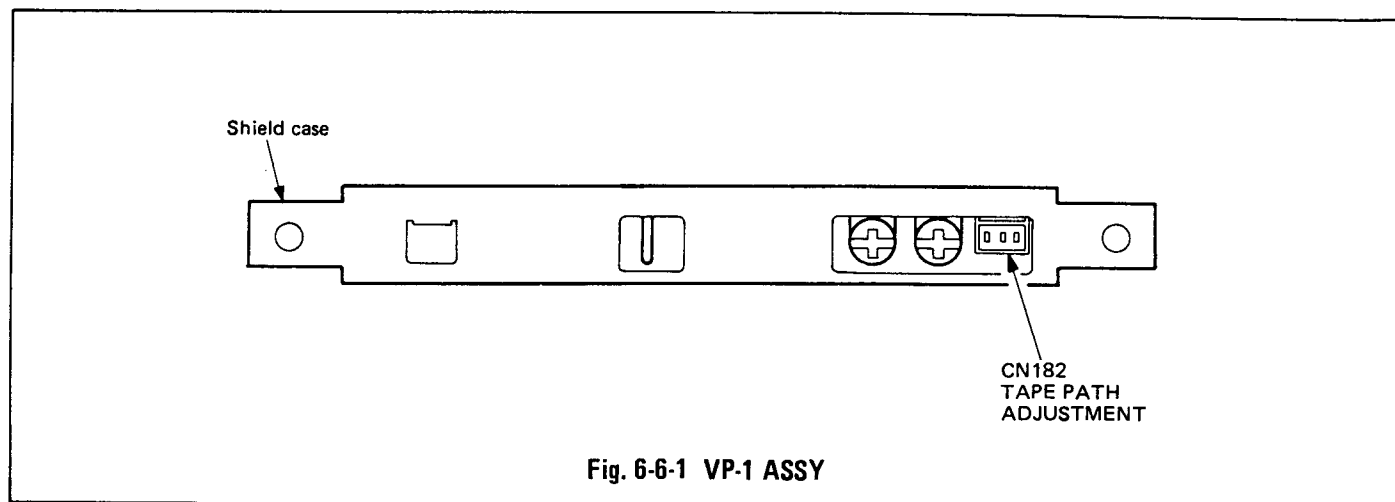


Fig. 6-5-1 IF Pack PCB (Part side view)

6-6. TEST POINT FOR TAPE PATH ADJUSTMENT

- The terminal (CN182) for tape path adjustment is shown in figure below.
For adjustment, refer to "5-4. TAPE PATH ADJUSTMENT".



7.ELECTRICAL PARTS

NOTE:

*Materials of Capacitors and Resistors are abbreviated as follows;

Resistors

MT-FILE	Metal Film Resistor
MT-GLAZE	Metal Glaze Resistor
OXIDE-MT	Oxide Metal Film Resistor

Capacitors

MT-POLYEST	Metallized Polyester Capacitor
MT-COMPO	Metallized Composite Capacitor

TA-SOLID	Tantalum Solid Capacitor
AL-SOLID	Aluminum Solid Capacitor
NP-ELECT	Non-Polarized Electrolytic Capacitor
OS-SOLID	Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
DL-ELECT	Double Layered Electrolytic Capacitor

*Tolerance of Capacitor(10pF over) and Resistor are noted with follw symbols.

F±1%	G±2%	J±5%	K±10%
M±20%	N±30%	Z+80% ~ -20%	

*N.S.P. : Not available as service parts.

C0MPL,CP-A

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
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C0MPL,CP-A

CONSISTS OF THE FOLLOWING:

VIDEO CIRCUIT

CAPACITORS

C1001	CERAMIC 4.7P D 50V	403 025 7007
C1002	CERAMIC 390P J 50V	403 073 2702
C1003	CERAMIC 100P J 50V	403 068 8801
C1004	CERAMIC 47P J 50V	403 026 2209
C1005	NP-ELECT 0.47U M 50V	403 086 1808
C1006	CERAMIC 91P J 50V	403 150 1703
C1007	CERAMIC 220P J 50V	403 071 5408
C1008	CERAMIC 820P J 50V	403 075 4001
C1009	ELECT 2.2U M 50V	403 049 9803
C1010	CERAMIC 0.01U M 16V	403 001 1906
C1011	ELECT 0.47U M 50V	403 048 6308
C1012	CERAMIC 33P J 50V	403 022 7703
C1013	CERAMIC 68P J 50V	403 030 6309
C1014	CERAMIC 100P J 50V	403 068 8801
C1015	POLYESTER 0.068U K 50V	403 063 2200
C1016	CERAMIC 0.01U M 16V	403 001 1906
C1017	CERAMIC 0.01U M 16V	403 001 1906
C1018	CERAMIC 0.01U M 16V	403 001 1906
C1019	ELECT 47U M 6.3V	403 039 2104
C1020	ELECT 2.2U M 50V	403 049 9803
C1021	ELECT 10U M 16V	403 041 8804
C1022	ELECT 2.2U M 50V	403 049 9803
C1023	CERAMIC 680P J 50V	403 074 8703
C1025	CERAMIC 0.01U M 16V	403 001 1906
C1026	ELECT 22U M 10V	403 040 1707
C1027	ELECT 0.47U M 50V	403 048 6308
C1028	CERAMIC 0.01U M 16V	403 001 1906
C1029	CERAMIC 560P J 50V	403 115 0901
C1030	CERAMIC 0.01U M 16V	403 001 1906
C1031	CERAMIC 0.01U M 16V	403 001 1906
C1032	ELECT 47U M 10V	403 041 2109
C1033	CERAMIC 0.01U M 16V	403 001 1906
C1034	CERAMIC 0.01U M 16V	403 001 1906
C1035	ELECT 47U M 10V	403 041 2109
C1036	ELECT 1U M 50V	403 049 0008
C1037	CERAMIC 56P J 50V	403 028 3402
C1038	CERAMIC 4.7P D 50V	403 025 7007
C1039	CERAMIC 33P J 50V	403 022 7703
C1040	ELECT 4.7U M 25V	403 046 9905
C1041	CERAMIC 0.01U M 16V	403 001 1906
C1042	CERAMIC 0.01U M 16V	403 001 1906
C1043	NP-ELECT 2.2U M 50V	403 086 5400
C1046	CERAMIC 120P J 50V	403 070 3702
C1047	CERAMIC 2700P K 50V	403 072 5407

LOCATION DESCRIPTION

RS PARTS NO. MFR.PARTS NO

C1048	CERAMIC 470P J 50V	403 073 6205
C1101	CERAMIC 0.022U J 25V	403 003 2505
C1102	CERAMIC 0.01U M 16V	403 001 1906
C1103	ELECT 1U M 50V	403 049 0008
C1104	CERAMIC 0.01U M 16V	403 001 1906
C1105	ELECT 1U M 50V	403 049 0008
C1106	ELECT 1U M 50V	403 049 0008
C1107	CERAMIC 0.022U J 25V	403 003 2505
C1108	CERAMIC 0.047U J 25V	403 104 8505
C1111	CERAMIC 0.01U M 16V	403 001 1906
C1112	ELECT 47U M 16V	403 043 9106
C1113	CERAMIC 0.01U M 16V	403 001 1906
C1116	ELECT 1U M 50V	403 049 0008
C1117	CERAMIC 0.047U J 25V	403 104 8505
C1118	CERAMIC 43P J 50V	403 025 8608
C1119	CERAMIC 91P J 50V	403 150 1703
C1120	CERAMIC 0.01U M 16V	403 001 1906
C1121	ELECT 47U M 6.3V	403 039 2104
C1122	CERAMIC 100P J 50V	403 068 8801
C1123	CERAMIC 0.01U M 16V	403 001 1906
C1125	CERAMIC 0.01U M 16V	403 001 1906
C1126	CERAMIC 0.01U M 16V	403 001 1906
C1127	ELECT 47U M 6.3V	403 039 2104
C1128	CERAMIC 0.01U M 16V	403 001 1906
C1401	ELECT 330U M 6.3V	403 038 9708
C1402	ELECT 47U M 6.3V	403 039 2104
C1403	ELECT 4.7U M 25V	403 046 9905
C1601	ELECT 47U M 6.3V	403 039 2104
C1602	ELECT 47U M 6.3V	403 039 2104
C1603	CERAMIC 0.01U M 16V	403 001 1906
C1604	ELECT 47U M 6.3V	403 039 2104
C1605	CERAMIC 0.01U M 16V	403 001 1906
C1606	ELECT 470U M 6.3V	403 039 3507
C1610	ELECT 100U M 16V	403 042 2405
C1611	CERAMIC 0.01U M 16V	403 001 1906
C1612	ELECT 22U M 10V	403 040 1707

COILS

L1001	HF CHOKE 68UH K	613 014 0951
L1002	HF CHOKE 100UH K	613 014 0975
L1003	HF CHOKE 33UH K	613 014 0913
L1004	HF CHOKE 56UH K	613 014 0944
L1005	HF CHOKE 2.2MH J	613 015 6365
L1006	HF CHOKE 68UH K	613 014 0951
L1007	HF CHOKE 1.0UH M	613 014 0739
L1102	HF CHOKE 18UH K	613 014 0883
L1103	HF CHOKE 3.3UH K	613 014 0791
L1104	HF CHOKE 15UH K	613 014 0876
L1601	HF CHOKE 100UH K	613 015 673C

DIODES

D1001	DIODE 6MA01-BT	407 007 9904
OR	DIODE 1SS133-T-77	407 012 4406
D1002	DIODE 6MA01-BT	407 007 9904

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
D1002	DIODE 1SS133-T-77		407 012 4406	R1108	CARBON 1K JA 1/4W		401 012 5609
D1003	DIODE GMA01-BT		407 007 9904	R1112	CARBON 10K JA 1/4W		401 012 6903
OR	DIODE 1SS133-T-77		407 012 4406	R1113	CARBON 1K JA 1/4W		401 012 5609
D1004	DIODE GMA01-BT		407 007 9904	R1114	CARBON 1.8K JA 1/4W		401 015 2605
OR	DIODE 1SS133-T-77		407 012 4406	R1116	CARBON 100K JA 1/4W		401 012 8006
D1005	ZENER DIODE GZS9.1Y-TB		407 070 8408	R1117	CARBON 1K JA 1/4W		401 012 5609
OR	ZENER DIODE MTZ9.1C-T-77		407 053 8906	R1118	CARBON 510 JA 1/4W		401 020 7800
D1601	DIODE GMA01-BT		407 007 9904	R1119	CARBON 1.5K JA 1/4W		401 014 4006
OR	DIODE 1SS133-T-77		407 012 4406	R1120	CARBON 470 JA 1/4W		401 020 0702
D1602	DIODE GMA01-BT		407 007 9904	R1121	CARBON 1K JA 1/4W		401 012 5609
OR	DIODE 1SS133-T-77		407 012 4406	R1122	CARBON 100 JA 1/4W		401 012 4404
D1603	DIODE GMA01-BT		407 007 9904	R1123	CARBON 1K JA 1/4W		401 012 5609
OR	DIODE 1SS133-T-77		407 012 4406	R1124	CARBON 16K JA 1/4W		401 014 9001
D1604	DIODE GMA01-BT		407 007 9904	R1125	CARBON 33K JA 1/4W		401 018 4804
OR	DIODE 1SS133-T-77		407 012 4406	R1126	CARBON 750 JA 1/4W		401 022 7105
D1605	DIODE GMA01-BT		407 007 9904	R1127	CARBON 1K JA 1/4W		401 012 5609
OR	DIODE 1SS133-T-77		407 012 4406	R1129	CARBON 560 JA 1/4W		401 021 1807
D1606	DIODE GMA01-BT		407 007 9904	R1130	CARBON 330 JA 1/4W		401 018 2701
OR	DIODE 1SS133-T-77		407 012 4406	R1131	CARBON 1K JA 1/4W		401 012 5609
DL111	DELAY,2H		613 077 4118	R1132	CARBON 330 JA 1/4W		401 018 2701
	IC'S			R1133	CARBON 8.2K JA 1/4W		401 023 2703
IC101	IC LA7340,VIDEO Y SIGNAL,DIP 30 PIN		409 178 3309	R1135	CARBON 1K JA 1/4W		401 012 5609
IC102	IC TL8709P,1 H DELAY,DIP,16 PIN		409 148 4800	R1401	CARBON 4.7K JA 1/4W		401 020 1907
IC103	IC LA7330,VIDEO C SIGNAL,DIP 24 PIN		409 154 7505	R1402	CARBON 4.7K JA 1/4W		401 020 1907
IC161	IC BA7021,INPUT SELECT,DIP,9 PIN		409 003 4501	R1404	CARBON 47K JA 1/4W		401 020 2805
	RESISTORS			R1405	CARBON 47K JA 1/4W		401 020 2805
R1001	CARBON 1K JA 1/4W		401 012 5609	R1406	CARBON 2.2K JA 1/4W		401 016 3700
R1002	CARBON 2.7K JA 1/4W		401 017 1705	R1407	CARBON 47K JA 1/4W		401 020 2805
R1003	CARBON 680 JA 1/4W		401 022 1806	R1408	CARBON 47K JA 1/4W		401 020 2805
R1004	CARBON 560 JA 1/4W		401 021 1807	R1409	CARBON 220 JA 1/4W		401 016 2505
R1005	CARBON 1M JA 1/4W		401 012 9201	R1410	CARBON 4.7K JA 1/4W		401 020 1907
R1006	CARBON 4.7K JA 1/4W		401 020 1907	R1411	CARBON 47K JA 1/4W		401 020 2805
R1007	CARBON 3K JA 1/4W		401 017 9206	R1412	CARBON 47K JA 1/4W		401 020 2805
R1008	CARBON 1K JA 1/4W		401 012 5609	R1413	CARBON 1.8K JA 1/4W		401 015 2605
R1009	CARBON 1K JA 1/4W		401 012 5609	R1414	CARBON 68K JA 1/4W		401 022 4005
R1010	CARBON 1K JA 1/4W		401 012 5609	R1601	CARBON 4.7K JA 1/4W		401 020 1907
R1011	CARBON 300 JA 1/4W		401 017 8506	R1602	CARBON 75 JA 1/4W		401 022 6702
R1012	CARBON 2K JA 1/4W		401 015 9406	R1603	CARBON 10K JA 1/4W		401 012 6903
R1013	CARBON 2.2K JA 1/4W		401 016 3700	R1604	CARBON 10K JA 1/4W		401 012 6903
R1014	CARBON 1K JA 1/4W		401 012 5609	R1606	CARBON 47K JA 1/4W		401 020 2805
R1015	CARBON 180K JA 1/4W		401 015 4609	R1607	CARBON 47K JA 1/4W		401 020 2805
R1016	CARBON 1M JA 1/4W		401 012 9201	R1608	CARBON 10K JA 1/4W		401 012 6903
R1017	CARBON 7.5K JA 1/4W		401 022 7600	R1609	CARBON 1K JA 1/4W		401 012 5609
R1018	CARBON 8.2K JA 1/4W		401 023 2703	R1610	CARBON 5.6K JA 1/4W		401 021 2903
R1019	CARBON 1.2K JA 1/4W		401 013 5202	R1611	CARBON 5.6K JA 1/4W		401 021 2903
R1021	CARBON 1K JA 1/4W		401 012 5609	R1612	CARBON 22K JA 1/4W		401 016 4707
R1022	CARBON 470K JA 1/4W		401 020 3802	R1613	CARBON 56 JA 1/4W		401 021 0602
R1023	CARBON 150K JA 1/4W		401 014 6000	R1617	CARBON 560 JA 1/4W		401 021 1807
R1024	CARBON 680 JA 1/4W		401 022 1806	R1618	CARBON 75 JA 1/4W		401 022 6702
R1025	CARBON 220 JA 1/4W		401 016 2505	R1619	CARBON 1.3K JA 1/4W		401 013 9408
R1026	CARBON 15K JA 1/4W		401 014 5102	R1621	CARBON 1.3K JA 1/4W		401 013 9408
R1028	CARBON 4.7K JA 1/4W		401 020 1907	R1625	CARBON 560 JA 1/4W		401 021 1807
R1029	CARBON 100 JA 1/4W		401 012 4404	VR101	SEMI VR 20K B		613 001 9424
R1030	CARBON 1K JA 1/4W		401 012 5609	VR102	SEMI VR 10K B		613 001 9417
R1031	CARBON 680 JA 1/4W		401 022 1806	VR103	SEMI VR 1K B		613 001 9370
R1032	CARBON 430 JA 1/4W		401 019 7200	VR104	SEMI VR 10K B		613 001 9417
R1033	CARBON 47 JA 1/4W		401 019 9501	VR111	SEMI VR 1K B		613 001 9370
R1034	CARBON 51 JA 1/4W		401 020 7404		TRANSISTORS		
R1035	CARBON 510 JA 1/4W		401 020 7800	B1001	TR DTC144ES-DCTP		405 000 6104
R1036	CARBON 51 JA 1/4W		401 020 7404	OR	TR 2SC3399-AC		405 018 2501
R1037	CARBON 620 JA 1/4W		401 021 8103	B1003	TR DTC144ES-DCTP		405 000 6104
R1101	CARBON 51K JA 1/4W		401 020 8807	OR	TR 2SC3399-AC		405 018 2501
R1102	CARBON 22K JA 1/4W		401 016 4707	B1601	TR DTC144ES-DCTP		405 000 6104
R1103	CARBON 1K JA 1/4W		401 012 5609	OR	TR 2SC3399-AC		405 018 2501
R1104	CARBON 1.2K JA 1/4W		401 013 5202	Q1001	TR 2SA608-E-SPA-AC		405 004 4007
R1107	CARBON 1K JA 1/4W		401 012 5609	OR	TR 2SA608-F-SPA-AC		405 004 4601
				OR	TR 2SA933S-TP-Q		405 006 1707
				OR	TR 2SA933S-T93-R		405 006 1806
				Q1002	TR 2SC1740S-DCTP-Q		405 011 8401
				OR	TR 2SC1740S-DCTP-R		405 011 8500

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
Q1002	TR 2SC536-E-SPA-AC		405 019 2005	XF111	LC PACK ,		613 004 5485
OR	TR 2SC536-F-SPA-AC		405 019 2807		1.6MHZ-4.43MHZ-5.06MHZ FILTER		
Q1003	TR 2SC1740S-DCTP-Q		405 011 8401				
OR	TR 2SC1740S-DCTP-R		405 011 8500	AUDIO CIRCUIT			
OR	TR 2SC536-E-SPA-AC		405 019 2005		CAPACITORS		
OR	TR 2SC536-F-SPA-AC		405 019 2807	C2001	ELECT 1U M 50V	403 049 1401	
Q1004	TR 2SC1740S-DCTP-Q		405 011 8401	C2002	CERAMIC 820P K 50V	403 075 4506	
OR	TR 2SC1740S-DCTP-R		405 011 8500	C2004	ELECT 33U M 6.3V	403 038 8602	
OR	TR 2SC536-E-SPA-AC		405 019 2005	C2005	CERAMIC 0.018U K 25V	403 003 0600	
OR	TR 2SC536-F-SPA-AC		405 019 2807	C2006	ELECT 0.47U M 50V	403 048 6308	
Q1005	TR 2SA608-E-SPA-AC		405 004 4007	C2008	CERAMIC 3300P K 16V	403 001 6505	
OR	TR 2SA608-F-SPA-AC		405 004 4601	C2009	ELECT 47U M 6.3V	403 039 2104	
OR	TR 2SA933S-TP-Q		405 006 1707	C2010	ELECT 10U M 16V	403 041 8804	
OR	TR 2SA933S-T93-R		405 006 1806	C2013	CERAMIC 0.022U J 25V	403 003 2406	
Q1006	TR 2SC1740S-DCTP-Q		405 011 8401	C2015	ELECT 4.7U M 25V	403 046 9905	
OR	TR 2SC1740S-DCTP-R		405 011 8500	C2016	ELECT 1U M 50V	403 049 0008	
OR	TR 2SC536-E-SPA-AC		405 019 2005	C2017	ELECT 33U M 16V	403 043 3906	
OR	TR 2SC536-F-SPA-AC		405 019 2807	C2018	ELECT 4.7U M 25V	403 046 9905	
Q1101	TR 2SA608-E-SPA-AC		405 004 4007	C2019	ELECT 47U M 16V	403 043 9106	
OR	TR 2SA608-F-SPA-AC		405 004 4601	C2020	CERAMIC 220P K 50V	403 071 6207	
OR	TR 2SA933S-TP-Q		405 006 1707	C2021	POLYPRO 0.033U J 100V	403 081 7409	
OR	TR 2SA933S-T93-R		405 006 1806	C2022	CERAMIC 0.01U K 25V	403 002 1905	
Q1102	TR 2SA608-E-SPA-AC		405 004 4007	C2024	CERAMIC 0.01U K 25V	403 002 1905	
OR	TR 2SA608-F-SPA-AC		405 004 4601	C2025	CERAMIC 0.022U Z 25V	403 003 3700	
OR	TR 2SA933S-TP-Q		405 006 1707	C2030	ELECT 1U M 50V	403 049 0008	
OR	TR 2SA933S-T93-R		405 006 1806	C2031	ELECT 1U M 50V	403 049 0008	
Q1103	TR 2SC1740S-DCTP-Q		405 011 8401	C2032	ELECT 1U M 50V	403 049 0008	
OR	TR 2SC1740S-DCTP-R		405 011 8500	C2034	ELECT 1U M 50V	403 049 0008	
OR	TR 2SC536-E-SPA-AC		405 019 2005	C2062	ELECT 33U M 16V	403 043 3906	
OR	TR 2SC536-F-SPA-AC		405 019 2807	C2075	ELECT 1U M 50V	403 049 0008	
Q1104	TR 2SC1740S-DCTP-Q		405 011 8401				
OR	TR 2SC1740S-DCTP-R		405 011 8500		COILS		
OR	TR 2SC536-E-SPA-AC		405 019 2005	L2002	HF CHOKE 10MH J	613 014 3037	
OR	TR 2SC536-F-SPA-AC		405 019 2807	L2003	CHOKE COIL 560UH K	613 015 8550	
Q1105	TR 2SC1740S-DCTP-Q		405 011 8401				
OR	TR 2SC1740S-DCTP-R		405 011 8500	T2001	OSC COIL 70KHZ	613 016 2205	
OR	TR 2SC536-E-SPA-AC		405 019 2005				
OR	TR 2SC536-F-SPA-AC		405 019 2807		IC'S		
Q1401	TR 2SA984-E-AA		405 006 6504	IC201	IC LA7294,AUDIO REC/PLAY,SIP,	409 133 1401	
OR	TR 2SA984-F-AA		405 006 6702		30 PIN		
Q1402	TR 2SA608-E-SPA-AC		405 004 4007	IC202	IC LA7016,SWITCH,SIP,8 PIN	409 018 7603	
OR	TR 2SA608-F-SPA-AC		405 004 4601				
OR	TR 2SA933S-TP-Q		405 006 1707		RESISTORS		
OR	TR 2SA933S-T93-R		405 006 1806	R2001	CARBON 100 JA 1/4W	401 012 4404	
Q1403	TR 2SA608-E-SPA-AC		405 004 4007	R2002	CARBON 6.8K JA 1/4W	401 022 3008	
OR	TR 2SA608-F-SPA-AC		405 004 4601	R2003	CARBON 120 JA 1/4W	401 013 4106	
OR	TR 2SA933S-TP-Q		405 006 1707	R2004	CARBON 390K JA 1/4W	401 019 3905	
OR	TR 2SA933S-T93-R		405 006 1806	R2005	CARBON 6.2K JA 1/4W	401 021 8905	
Q1404	TR 2SB985-T-AE		405 009 7003	R2006	CARBON 2.7K JA 1/4W	401 017 1705	
Q1405	TR 2SC1740S-DCTP-Q		405 011 8401	R2007	CARBON 8.2K JA 1/4W	401 023 2703	
OR	TR 2SC1740S-DCTP-R		405 011 8500	R2008	CARBON 2.7K JA 1/4W	401 017 1705	
OR	TR 2SC536-E-SPA-AC		405 019 2005	R2009	CARBON 3.3M JA 1/4W	401 018 6501	
OR	TR 2SC536-F-SPA-AC		405 019 2807	R2010	CARBON 10K JA 1/4W	401 012 6903	
Q1406	TR 2SC1740S-DCTP-Q		405 011 8401	R2011	CARBON 9.1K JA 1/4W	401 023 7401	
OR	TR 2SC1740S-DCTP-R		405 011 8500	R2012	CARBON 5.1K JA 1/4W	401 020 8302	
OR	TR 2SC536-E-SPA-AC		405 019 2005	R2013	CARBON 1K JA 1/4W	401 012 5609	
OR	TR 2SC536-F-SPA-AC		405 019 2807	R2014	CARBON 1.8K JA 1/4W	401 015 2605	
Q1601	TR 2SA608-E-SPA-AC		405 004 4007	R2016	CARBON 10K JA 1/4W	401 012 6903	
OR	TR 2SA608-F-SPA-AC		405 004 4601	R2017	CARBON 10K JA 1/4W	401 012 6903	
OR	TR 2SA933S-TP-Q		405 006 1707	R2018	CARBON 18K JA 1/4W	401 105 3701	
OR	TR 2SA933S-T93-R		405 006 1806	R2019	CARBON 18K JA 1/4W	401 105 3701	
Q1603	TR 2SA608-F-SPA-AC		405 004 4601	R2021	CARBON 10 JA 1/4W	401 012 3308	
OR	TR 2SA933S-T93-R		405 006 1806	R2022	CARBON 47 JA 1/4W	401 019 9501	
Q1605	TR 2SA608-E-SPA-AC		405 004 4007	R2023	CARBON 15K JA 1/4W	401 014 5102	
OR	TR 2SA608-F-SPA-AC		405 004 4601	R2024	CARBON 4.7 JA 1/4W	401 019 6104	
OR	TR 2SA933S-TP-Q		405 006 1707	R2040	CARBON 10K JA 1/4W	401 012 6903	
OR	TR 2SA933S-T93-R		405 006 1806	R2062	CARBON 100 JA 1/4W	401 012 4404	
	MISCELLANEOUS			R2101	CARBON 30K JA 1/4W	401 017 9701	
X1101	OSC,CRYSTAL 4.433619MHZ	613 093 8008		R2102	CARBON 4.3K JA 1/4W	401 019 7705	
				R2103	CARBON 47K JA 1/4W	401 020 2805	
XF101	LC PACK 4MHZ LPF	613 004 5539		R2104	CARBON 4.3K JA 1/4W	401 019 7705	
				R2105	CARBON 820 JA 1/4W	401 023 1607	

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
R2107	CARBON 2.7K JA 1/4W		401 017 1705	R3021	CARBON 33K JA 1/4W		401 018 4804
R2108	CARBON 2.7K JA 1/4W		401 017 1705	R3022	CARBON 4.7K JA 1/4W		401 020 1907
R2109	CARBON 820 JA 1/4W		401 023 1607	R3023	CARBON 4.7K JA 1/4W		401 020 1907
R2110	CARBON 1.8K JA 1/4W		401 015 2605	R3024	CARBON 4.7K JA 1/4W		401 020 1907
VR201	SEMI VR 100K B		613 001 9097	R3025	CARBON 1K JA 1/4W		401 012 5609
VR202	SEMI VR 10K B		613 001 9035	R3026	CARBON 1K JA 1/4W		401 012 5609
				R3027	CARBON 4.7K JA 1/4W		401 020 1907
				R3028	CARBON 4.7K JA 1/4W		401 020 1907
				R3029	CARBON 4.7K JA 1/4W		401 020 1907
				R3030	CARBON 1K JA 1/4W		401 012 5609
Q2001	TR 2SD734-E-AA		405 024 9709	R3031	CARBON 1K JA 1/4W		401 012 5609
OR	TR 2SD734-F-AA		405 024 9907	R3032	CARBON 1K JA 1/4W		401 012 5609
				R3033	CARBON 1K JA 1/4W		401 012 5609
				R3034	CARBON 1K JA 1/4W		401 012 5609
				R3035	CARBON 10K JA 1/4W		401 012 6903
				R3036	CARBON 4.7K JA 1/4W		401 020 1907
				R3037	CARBON 10K JA 1/4W		401 012 6903
				R3038	CARBON 10K JA 1/4W		401 012 6903
				R3039	CARBON 750 JA 1/4W		401 022 7105
				R3041	CARBON 4.7K JA 1/4W		401 020 1907
				R3042	CARBON 4.7K JA 1/4W		401 020 1907
				R3043	CARBON 1.5K JA 1/4W		401 014 4006
				R3044	CARBON 1.5K JA 1/4W		401 014 4006
				R3045	CARBON 100K JA 1/4W		401 012 8006
				R3046	CARBON 820K JA 1/4W		401 023 4509
				R3047	CARBON 100K JA 1/4W		401 012 8006
				R3048	CARBON 100K JA 1/4W		401 012 8006
				R3049	CARBON 1K JA 1/4W		401 012 5609
				R3050	CARBON 22K JA 1/4W		401 016 4707
				R3051	CARBON 47K JA 1/4W		401 020 2805
				R3052	CARBON 4.7K JA 1/4W		401 020 1907
				R3101	CARBON 47K JA 1/4W		401 020 2805

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
C3529	CERAMIC 0.068U K 25V		403 004 4607	R3541	CARBON 360 JA 1/4W		401 018 7508
C3530	ELECT 10U M 16V		403 041 8804	R3542	CARBON 510 JA 1/4W		401 020 7800
C3531	ELECT 3.3U M 50V		403 050 6600	R3543	CARBON 510 JA 1/4W		401 020 7800
C3532	CERAMIC 2200P K 16V		403 001 5003	R3590	CARBON 12K JA 1/4W		401 013 6308
C3533	CERAMIC 1000P K 50V		403 069 1207				
C3534	NP-ELECT 33U M 6.3V		403 162 1609	VR351	SEMI VR 220K B		613 001 9110
C3535	CERAMIC 1000P K 50V		403 069 1207	VR358	VR,ROTARY 100K B		613 094 6034
C3536	POLYESTER 0.039U J 50V		403 061 3308				
C3537	ELECT 47U M 6.3V		403 039 2104		TRANSISTORS		
C3541	CERAMIC 120P K 50V		403 070 4105	B3501	TR DTC144ES-DCTP		405 000 6104
C3559	ELECT 22U M 10V		403 040 1707	OR	TR 2SC3399-AC		405 018 2501
				B3512	TR 2SC3399-AC		405 018 2501
				OR	TR DTC144ES-DCTP		405 000 6104
	DIODES						
D3501	DIODE GMA01-BT		407 007 9904				
OR	DIODE 1SS133-T-77		407 012 4406	Q3501	TR 2SC1740S-DCTP-R		405 011 8500
D3502	DIODE GMA01-BT		407 007 9904	OR	TR 2SC536-F-SPA-AC		405 019 2807
OR	DIODE 1SS133-T-77		407 012 4406	Q3502	TR 2SD734-E-AA		405 024 9709
D3503	DIODE GMA01-BT		407 007 9904	OR	TR 2SD734-F-AA		405 024 9907
OR	DIODE 1SS133-T-77		407 012 4406				
D3504	DIODE GMA01-BT		407 007 9904		POWER SUPPLY CIRCUIT		
OR	DIODE 1SS133-T-77		407 012 4406				
D3505	DIODE GMA01-BT		407 007 9904		CAPACITORS		
OR	DIODE 1SS133-T-77		407 012 4406	C5401	CERAMIC 0.01U K 16V		403 001 1609
D3511	DIODE GMA01-BT		407 007 9904	C5402	ELECT 47U M 6.3V		403 039 3200
OR	DIODE 1SS133-T-77		407 012 4406				
D3534	DIODE GMA01-BT		407 007 9904		DIODES		
OR	DIODE 1SS133-T-77		407 012 4406	D5401	DIODE GMA01-BT		407 007 9904
				OR	DIODE 1SS133-T-77		407 012 4406
	IC'S			D5402	ZENER DIODE MTZ5.1B-T-77		407 053 6308
IC351	IC LC7416-8080,SERVO C.P.U.,C MOS,DIP,42 PIN		409 180 3700	D5403	ZENER DIODE MTZ12A-T-77		407 053 3109
IC352	IC LA7123,AMP,BIPOLAR,DIP,30, PIN		409 178 3507	D5404	DIODE 1SS244-T-77		407 078 2705
				D5405	ZENER DIODE MTZ33A-T-77		407 078 1104
				D5406	ZENER DIODE MTZ10C-T-77		407 053 2706
	RESISTORS						
R3501	CARBON 10K JA 1/4W		401 012 6903	R5401	CARBON 6.2K JA 1/4W		401 021 8905
R3502	CARBON 1.5K JA 1/4W		401 014 4006	R5402	CARBON 2.2K JA 1/4W		401 016 3700
R3503	CARBON 22K JA 1/4W		401 016 4707	R5403	CARBON 430 JA 1/4W		401 019 7200
R3504	CARBON 22K JA 1/4W		401 016 4707	R5404	FUSIBLE RES 820 JA 1/4W		402 041 6209
R3505	CARBON 270K JA 1/4W		401 017 3709	R5405	CARBON 3.3K JA 1/4W		401 018 3708
R3506	CARBON 150K JA 1/4W		401 014 6000	R5406	CARBON 15K JA 1/4W		401 014 5102
R3509	CARBON 18K JA 1/4W		401 105 3701	R5407	CARBON 4.3K JA 1/4W		401 019 7705
R3510	CARBON 33K JA 1/4W		401 018 4804	R5408	FUSIBLE RES 47 JA 1/4W		402 004 1906
R3511	CARBON 10K JA 1/4W		401 012 6903	R5409	CARBON 12K JA 1/4W		401 013 6308
R3512	CARBON 100K JA 1/4W		401 012 8006	R5410	CARBON 150 JA 1/4W		401 014 2804
R3513	CARBON 100K JA 1/4W		401 012 8006	R5411	CARBON 150 JA 1/4W		401 014 2804
R3514	CARBON 330K JA 1/4W		401 018 5702				
R3515	CARBON 15K JA 1/4W		401 014 5102		TRANSISTORS		
R3516	CARBON 150K JA 1/4W		401 014 6000	Q5401	TR 2SA1703-S-AN		405 088 9103
R3517	CARBON 150K JA 1/4W		401 014 6000	Q5402	TR 2SC3070-AE		405 016 9601
R3518	CARBON 10K JA 1/4W		401 012 6903	Q5403	TR 2SA984K-E-AA		405 006 7006
R3519	CARBON 33K JA 1/4W		401 018 4804	OR	TR 2SA984K-F-AA		405 006 7204
R3520	CARBON 33K JA 1/4W		401 018 4804	Q5404	TR 2SA984K-E-AA		405 006 7006
R3521	CARBON 330K JA 1/4W		401 018 5702	OR	TR 2SA984K-F-AA		405 006 7204
R3522	CARBON 150K JA 1/4W		401 014 6000				
R3523	CARBON 27K JA 1/4W		401 017 2702		TUNER CIRCUIT		
R3524	CARBON 22K JA 1/4W		401 016 4707				
R3525	CARBON 20K JA 1/4W		401 016 0006		CAPACITORS		
R3526	CARBON 100K JA 1/4W		401 012 8006	C6001	MT-COMPO 0.1U J 50V		403 067 5603
R3527	CARBON 150K JA 1/4W		401 014 6000	C6004	MT-COMPO 0.1U J 50V		403 067 5603
R3528	CARBON 100K JA 1/4W		401 012 8006	C6006	ELECT 100U M 16V		403 042 2405
R3529	CARBON 10K JA 1/4W		401 012 6903	C6007	CERAMIC 0.01U M 16V		403 001 1906
R3530	CARBON 47K JA 1/4W		401 020 2805				
R3531	CARBON 1M JA 1/4W		401 012 9201		COILS		
R3532	CARBON 2.2K JA 1/4W		401 016 3700	L6601	HF CHOKE 15UH K		613 015 6631
R3533	CARBON 220K JA 1/4W		401 016 5704	L6602	HF CHOKE 15UH K		613 015 6631
R3534	CARBON 2.2K JA 1/4W		401 016 3700				
R3535	CARBON 2.2K JA 1/4W		401 016 3700		RESISTORS		
R3536	CARBON 1K JA 1/4W		401 012 5609	R6001	CARBON 330 JA 1/4W		401 018 2701
R3537	CARBON 1K JA 1/4W		401 012 5609	R6002	CARBON 390 JA 1/4W		401 019 0904
R3538	CARBON 1K JA 1/4W		401 012 5609	R6003	CARBON 1M JA 1/4W		401 012 9201
R3539	CARBON 510K JA 1/4W		401 020 9200	R6004	CARBON 390K JA 1/4W		401 019 3905
R3540	CARBON 220K JA 1/4W		401 016 5704	R6005	CARBON 470K JA 1/4W		401 020 3802

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
R6006	CARBON 390K JA 1/4W		401 019 3905
R6007	CARBON 270K JA 1/4W		401 017 3709
R6008	CARBON 1K JA 1/4W		401 012 5609
TRANSISTORS			
B6001	TR 2SC3399-AC		405 018 2501
Q6001	TR 2SK68A-K		405 027 8709
Q6002	TR 2SA608-E-SPA-AC		405 004 4007
OR	TR 2SA933S-TP-Q		405 006 1707
OR	TR 2SA933S-T93-R		405 006 1806
OR	TR 2SA608-F-SPA-AC		405 004 4601

TIMER CIRCUIT

CAPACITORS			
C7001	ELECT 22U M 16V		403 042 7707
C7002	CERAMIC 0.1U Z 50V		403 121 9509
C7003	ELECT 22U M 50V		403 050 2800
C7004	CERAMIC 0.1U Z 50V		403 121 9509
C7005	ELECT 22U M 16V		403 042 7707
C7021	CERAMIC 0.1U Z 50V		403 121 9509
C7022	CERAMIC 180P K 50V		403 071 2001
C7023	CERAMIC 1000P K 50V		403 069 1207
C7024	MT-COMPO 0.1U J 50V		403 067 5603
C7025	MT-COMPO 0.33U J 50V		403 067 7300
C7031	ELECT 10U M 16V		403 041 8804
C7032	ELECT 0.33U M 50V		403 048 4205
C7033	CERAMIC 2200P K 16V		403 001 5003
C7034	CERAMIC 1000P K 50V		403 069 1207

DIODES			
D7001	DIODE 6MA01-BT		407 007 9904
OR	DIODE 1SS133-T-77		407 012 4406

IC'S			
IC701	IC UPC574J		409 057 5103
IC702	IC LA7910,BAND SELECT,SIP,9 PIN		409 019 6209
IC703	IC LA7214,SYNC SEPA,BIPOLAR, SIP,9 PIN		409 114 4308

RESISTORS			
R7001	CARBON 47K JA 1/4W		401 020 2805
R7002	CARBON 1.2K JA 1/4W		401 013 5202
R7004	CARBON 10K JA 1/4W		401 012 6903
R7005	CARBON 10K JA 1/4W		401 012 6903
R7021	CARBON 3.9K JA 1/4W		401 019 1802
R7022	CARBON 33K JA 1/4W		401 018 4804
R7023	CARBON 10K JA 1/4W		401 012 6903
R7024	CARBON 10K JA 1/4W		401 012 6903
R7025	CARBON 47K JA 1/4W		401 020 2805
R7026	CARBON 22K JA 1/4W		401 016 4707
R7027	CARBON 4.7K JA 1/4W		401 020 1907
R7031	CARBON 330 JA 1/4W		401 018 2701
R7032	CARBON 330K JA 1/4W		401 018 5702
R7033	CARBON 270K JA 1/4W		401 017 3709
R7034	CARBON 100K JA 1/4W		401 012 8006

TRANSISTORS			
B7001	TR DTC114ES-OCTP		405 000 3103
OR	TR 2SC3402-AC		405 018 2808
B7002	TR DTA144EL-TL2		405 063 9104
Q7001	TR 2SB985-T-AE		405 009 7003
Q7021	TR 2SC2960-F-SPA-AC		405 084 8209

RF CONVERTER CIRCUIT

CAPACITORS			
C6601	ELECT 100U M 6.3V		403 038 1603
C6602	ELECT 100U M 6.3V		403 038 1603

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
DIODES			
D6601	DIODE DSK10C-BT		407 004 9709

COMPL.VP-1

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
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COMPL.VP-1

CONSISTS OF THE FOLLOWING:

613 091 8185

CAPACITORS			
C1801	CERAMIC 120P J 50V		403 070 3702
C1802	CERAMIC 100P K 50V		403 068 9402
C1803	CERAMIC 0.022U M 25V		403 003 3304
C1804	ELECT 1U M 50V		403 049 0800
C1805	CERAMIC 2200P M 25V		403 003 1805
C1806	CERAMIC 0.033U M 25V		403 003 7104
C1807	CERAMIC 47P J 50V		403 026 2209
C1808	CERAMIC 47P J 50V		403 026 2209
C1809	CERAMIC 0.033U M 25V		403 003 7104
C1810	CERAMIC 2200P M 25V		403 003 1805
C1811	ELECT 47U M 6.3V		403 039 2609
C1812	CERAMIC 0.01U M 16V		403 001 1906
C1813	CERAMIC 27P J 50V		403 019 9703
C1814	CERAMIC 47P J 50V		403 026 2209
C1815	CERAMIC 68P J 50V		403 030 6309
C1816	CERAMIC 33P J 50V		403 022 7703
C1817	CERAMIC 0.01U M 16V		403 001 1906
C1818	ELECT 47U M 16V		403 043 9601
C1819	CERAMIC 0.01U M 16V		403 001 1906
C1820	CERAMIC 0.022U M 25V		403 003 3304
C1821	CERAMIC 0.01U M 16V		403 001 1906
C1822	CERAMIC 0.01U M 16V		403 001 1906
C1823	CERAMIC 1000P K 50V		403 069 1207
C1824	CERAMIC 62P J 50V		403 030 3506
C1825	CERAMIC 56P J 50V		403 028 3402
C1826	CERAMIC 330P J 50V		403 072 7500

COILS			
L1801	HF CHOKE 82UH K		613 014 0968
L1802	HF CHOKE 390UH J		613 015 6273
L1803	HF CHOKE 100UH K		613 015 6730
L1804	HF CHOKE 18UH K		613 014 0883
L1805	HF CHOKE 15UH K		613 014 0876
L1806	HF CHOKE 15UH K		613 014 0876
L1807	HF CHOKE 56UH K		613 014 0944
L1808	HF CHOKE 100UH K		613 015 6730
L1809	HF CHOKE 6.8UH K		613 014 0838
L1810	HF CHOKE 22UH K		613 014 0890

IC'S			
IC181	IC LA7320,REC AMP,DIP,22 PIN		409 134 2001

RESISTORS			
R1801	CARBON 470 JA 1/4W		401 020 0702
R1802	CARBON 220 JA 1/4W		401 016 2505
R1803	CARBON 560 JA 1/4W		401 021 1807
R1804	CARBON 5.1 JA 1/4W		401 020 5509
R1806	CARBON 1.2K JA 1/4W		401 013 5202
R1807	CARBON 2.2K JA 1/4W		401 016 3700
R1808	CARBON 820 JA 1/4W		401 023 1607
R1809	CARBON 820 JA 1/4W		401 023 1607
R1810	CARBON 270 JA 1/4W		401 017 0708
R1811	CARBON 560 JA 1/4W		401 021 1807
R1812	CARBON 750 JA 1/4W		401 022 7105

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
R1813	CARBON 390 JA 1/4W	401 019 0904	
R1814	CARBON 390 JA 1/4W	401 019 0904	
R1815	CARBON 2.2K JA 1/4W	401 016 3700	
R1816	CARBON 2.2K JA 1/4W	401 016 3700	
R1817	CARBON 1K JA 1/4W	401 012 5609	
R1818	CARBON 180 JA 1/4W	401 015 1509	
R1819	CARBON 2.2K JA 1/4W	401 016 3700	
VR181	SEMI VR 1K B	613 002 0345	
VR182	SEMI VR 1K B	613 002 0345	

TRANSISTORS

Q1801	TR 2SC2058S-DCTP-Q	405 012 9506	
OR	TR 2SC2669-O-TPE4	405 015 2504	
OR	TR 2SC2669-Y-TPE4	405 015 2603	
OR	TR 2SC2839-E-SPA-AC	405 016 0905	
OR	TR 2SC2839-F-SPA-AC	405 016 1100	
Q1802	TR 2SC2058S-DCTP-Q	405 012 9506	
OR	TR 2SC2669-O-TPE4	405 015 2504	
OR	TR 2SC2669-Y-TPE4	405 015 2603	
OR	TR 2SC2839-E-SPA-AC	405 016 0905	
OR	TR 2SC2839-F-SPA-AC	405 016 1100	
Q1803	TR 2SC2058S-DCTP-Q	405 012 9506	
OR	TR 2SC2669-O-TPE4	405 015 2504	
OR	TR 2SC2669-Y-TPE4	405 015 2603	
OR	TR 2SC2839-E-SPA-AC	405 016 0905	
OR	TR 2SC2839-F-SPA-AC	405 016 1100	

COMPL, PW-1

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
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COMPL, PW-1

CONSISTS OF THE FOLLOWING:

613 091 8192

CAPACITORS

C5001	MT-POLYEST 4700P M 250V	404 044 8709	
C5101	ELECT 2200U M 25V	403 148 0701	
C5102	ELECT 2200U M 25V	403 148 0701	
C5103	ELECT 3300U M 16V	403 158 0500	
C5104	ELECT 47U M 50V	403 121 6607	
C5105	ELECT 47U M 100V	403 155 5805	
OR	ELECT 47U M 100V	403 110 1408	
C5106	MT-POLYEST 0.1U J 63V	403 065 8002	
C5107	ELECT 47U M 35V	403 054 0703	
C5108	ELECT 10U M 16V	403 041 8804	
C5109	ELECT 10U M 16V	403 041 8804	
C5110	ELECT 10U M 16V	403 041 8804	

DIODES

D5101	DIODE DSF10TC-BT	407 004 9600	
D5102	DIODE DSF10TC-BT	407 004 9600	
D5103	DIODE DSA17C-KC6	407 004 6708	
D5104	DIODE DSA17C-KC6	407 004 6708	
D5105	DIODE DSK10C-BT	407 004 9709	
D5106	DIODE DSK10C-BT	407 004 9709	
D5107	DIODE DSK10C-BT	407 004 9709	
D5108	DIODE DSK10C-BT	407 004 9709	
D5109	DIODE 1SS244-T-77	407 078 2705	
D5110	DIODE 1SS244-T-77	407 078 2705	
D5111	ZENER DIODE GZS24Y-BT	407 070 3502	
OR	ZENER DIODE MTZ24B-T-77	407 078 0305	

FUSE

F5001	FUSE 250V 0.4A	423 003 3708	
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LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
F5101	△ FUSE 250V 0.8A	423 004 3004	
F5102	△ FUSE 250V 1.6A	423 005 4901	
F5103	△ FUSE 250V 2A	423 006 1305	
F5104	△ FUSE 250V0.315A	423 004 6708	
	RESISTORS		
R5102	CARBON 4.3K JA 1/4W	401 019 7705	
R5103	CARBON 4.3K JA 1/4W	401 019 7705	
R5104	CARBON 2.2K JA 1/4W	401 016 3700	
R5105	CARBON 2.2K JA 1/4W	401 016 3700	

COMPL, PW-2

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
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COMPL, PW-2

CONSISTS OF THE FOLLOWING:

613 091 8208

IC'S

IC521	IC STK5473, POWER REGULATOR, SIP, 10 PIN	409 149 6704	
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COMPL, TM-1

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
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COMPL, TM-1

CONSISTS OF THE FOLLOWING:

613 098 7495

CAPACITORS

C7101	CERAMIC 10P J 50V	403 009 1809	
C7102	CERAMIC 22P J 50V	403 017 9705	
C7103	CERAMIC 22P J 50V	403 017 9705	
C7104	CERAMIC 0.1U Z 50V	403 121 9509	
C7105	ELECT 22U M 16V	403 042 8407	
C7106	CERAMIC 0.01U M 16V	403 001 1906	
C7107	CERAMIC 0.01U M 16V	403 001 1906	
C7108	ELECT 0.47U M 50V	403 048 7107	
C7109	CERAMIC 0.1U Z 50V	403 121 9509	
C7110	DL-ELECT 0.033F Z 5.5V	403 115 0604	
C7111	CERAMIC 0.1U Z 50V	403 121 9509	
C7112	CERAMIC 0.01U M 16V	403 001 1906	
C7113	ELECT 10U M 16V	403 041 9603	

CT711	TRIMMER 20P N750	613 002 6583	
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DIODES

D7101	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7102	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7103	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7104	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7105	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
D7107	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7108	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7109	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7110	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7121	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
D7122	DIODE GMA01-BT	407 007 9904	
OR	DIODE 1SS133-T-77	407 012 4406	
IC'S			
IC711	IC M50957-125SP.TIMER C.P.U., C MOS, 8 BIT.DIP,64 PIN	409 173 1904	
IC712	IC MN1280-L,RESET,SIP,3 PIN	409 032 3308	
IC713	IC M6M80011P.MEMORY,RAM,DIP,8 PIN	409 151 7904	
RESISTORS			
R7101	CARBON 1M JA 1/4W	401 012 9201	
R7102	CARBON 10M JA 1/4W	401 110 6201	
R7103	CARBON 330K JA 1/4W	401 018 5702	
R7104	CARBON 1K JA 1/4W	401 012 5609	
R7106	CARBON 1K JA 1/4W	401 012 5609	
R7108	CARBON 1K JA 1/4W	401 012 5609	
R7110	CARBON 1K JA 1/4W	401 012 5609	
R7116	CARBON 22K JA 1/4W	401 016 4707	
R7117	CARBON 10K JA 1/4W	401 012 6903	
R7118	CARBON 1K JA 1/4W	401 012 5609	
R7119	CARBON 1K JA 1/4W	401 012 5609	
R7122	CARBON 1K JA 1/4W	401 012 5609	
R7123	CARBON 1K JA 1/4W	401 012 5609	
R7124	CARBON 33K JA 1/4W	401 018 4804	
R7125	CARBON 1K JA 1/4W	401 012 5609	
RB711	R-NETWORK,10KX6	613 079 5892	
RB712	R-NETWORK,10KX4	613 079 5878	
SWITCHES			
S7101	SW,PUSH,PLAY	613 079 4130	
S7102	SW,PUSH,STOP	613 079 4130	
S7103	SW,PUSH,PAUSE	613 079 4130	
S7105	SW,PUSH,PROG	613 079 4130	
S7106	SW,PUSH,UP	613 079 4130	
S7108	SW,PUSH,TR.UP	613 079 4130	
S7113	SW,PUSH,REC	613 079 4130	
S7117	SW,PUSH,CLK	613 079 4130	
S7118	SW,PUSH,DOWN	613 079 4130	
S7120	SW,PUSH,TR.DOWN	613 079 4130	
S7125	SW,PUSH,REW	613 079 4130	
S7126	SW,PUSH,FF	613 079 4130	
S7129	SW,PUSH,PRESET	613 079 4130	
S7130	SW,PUSH,OK	613 079 4130	
S7137	SW,PUSH,ALL CLEAR	613 079 4130	
S7214	SW,PUSH	613 079 4130	
MISCELLANEOUS			
A7101	FLUORESCENT TUBE	613 084 3197	
X7101	CRYSTAL 6.291456MHZ	613 022 4569	
X7102	CRYSTAL 32.768KHZ	613 002 8594	

COMPL,TH-2

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
COMPL,TH-2			613 097 1449
CONSISTS OF THE FOLLOWING:			
MISCELLANEOUS			
RR721	IR RECIEVER PACK		613 094 0421

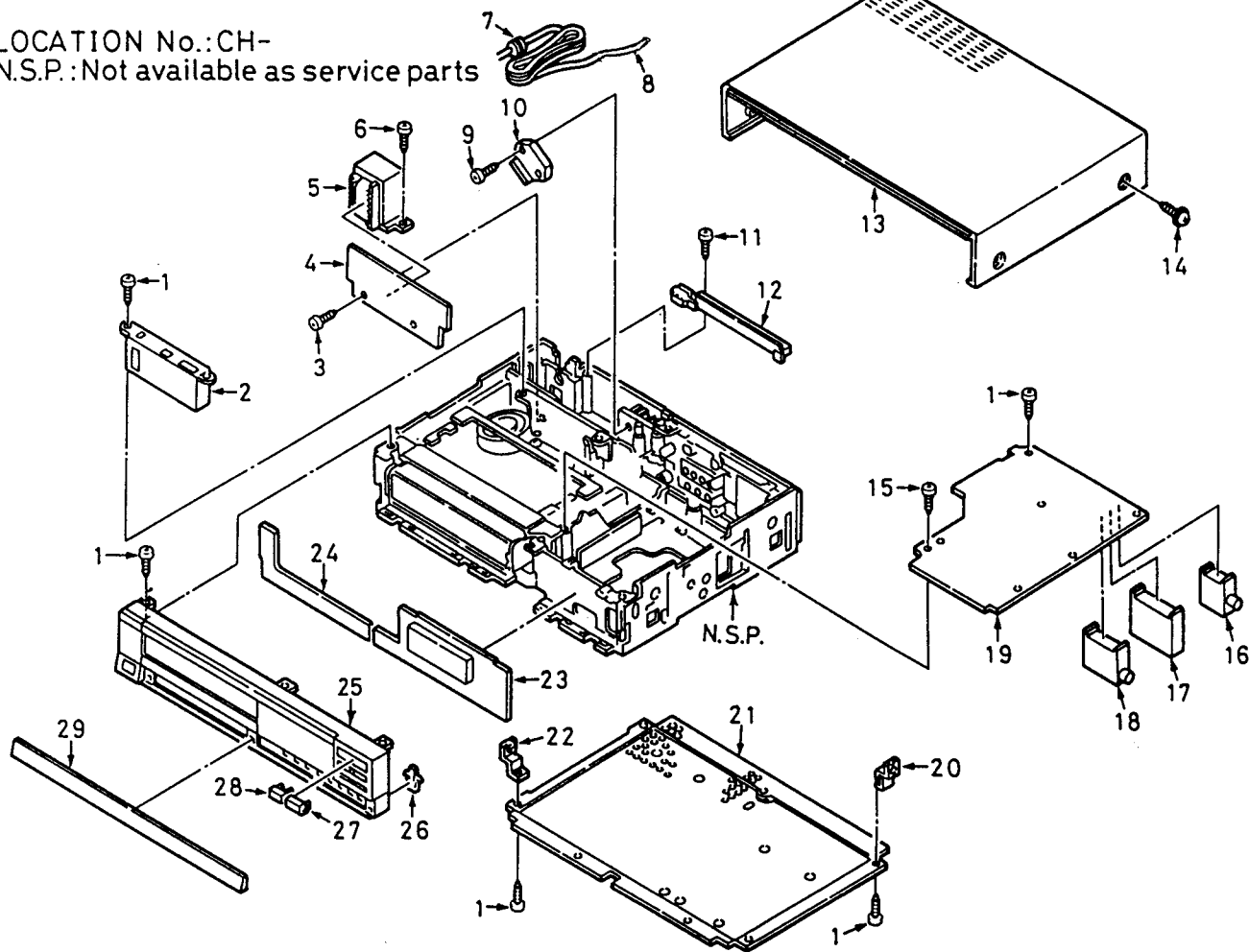
COMPL,MC-1

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
COMPL,MC-1			613 077 9489
CONSISTS OF THE FOLLOWING:			
D1	PHOTO COUPLE SPI-315-04-C		407 094 1300
OR	PHOTO DIODE ON2170-R		407 043 0101
R1	CARBON 270 JA 1/6W		401 026 0607
OR	CARBON 270 JA 1/4W		401 017 0708
R2	CARBON 100 JA 1/6W		401 024 6700
OR	CARBON 100 JA 1/4W		401 012 4404
S1	SPECIAL,SWITCH,FRONT END		613 022 4538
S2	SPECIAL SWITCH, ERASURE-PREVENTION		613 022 4545

8.MECHANICAL PARTS LIST

LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
8-1. CABINET & CHASSIS PARTS				CH-17	IF PACK	613 096	5653
CH-1	SCR S-TPG BIN 3X10	411 021	3503	CH-18	TUNER PACK	613 097	3597
CH-2	COMPL,VP-1	613 091	8185	CH-19	COMPL,CP-A	613 098	8294
CH-3	SCR S-TPG BIN 3X8	411 021	6405	CH-20	BRACKET	613 048	6912
CH-4	COMPL,PW-1	613 091	8192	CH-21	COVER,BOTTOM	613 022	0578
CH-5	△ TRANS,POWER	613 095	3872	CH-22	BRACKET,CABINET	613 022	0738
CH-6	SCR S-TPG BIN 4X8	411 021	9604	CH-23	COMPL,TM-1	613 098	7495
CH-7	△ FIXER	613 053	6686	CH-24	COMPL,TM-2	613 097	1449
CH-8	△ CORD,POWER	613 086	0514	CH-25	ASSY,CABINET,FRONT	613 097	1654
CH-9	SCR S-TPG BIN 3X16	411 021	4500	CH-26	LOCK	613 048	2884
CH-10	COMPL,PW-2	613 091	8208	CH-27	BUTTON,PLAY	613 099	7227
CH-11	SCR S-TPG BIN 3X10	411 021	3701	CH-28	BUTTON,STOP	613 099	7210
CH-12	BLIND	613 077	3487	CH-29	DOOR,FRONT	613 097	1845
CH-13	COVER,TOP	613 022	0547	HARDWARE KIT			
CH-14	SPECIAL SCREW	412 024	7604	SPECIAL SCREW			412 024 7604
CH-15	SCR S-TPG BIN 3X10	411 021	3800	SCR S-TPG BIN 3X10			411 021 3701
CH-16	MODULATOR,RF	613 096	0160	SCR S-TPG BIN 3X10			411 021 3503
OR	MODULATOR,RF	613 079	2358				

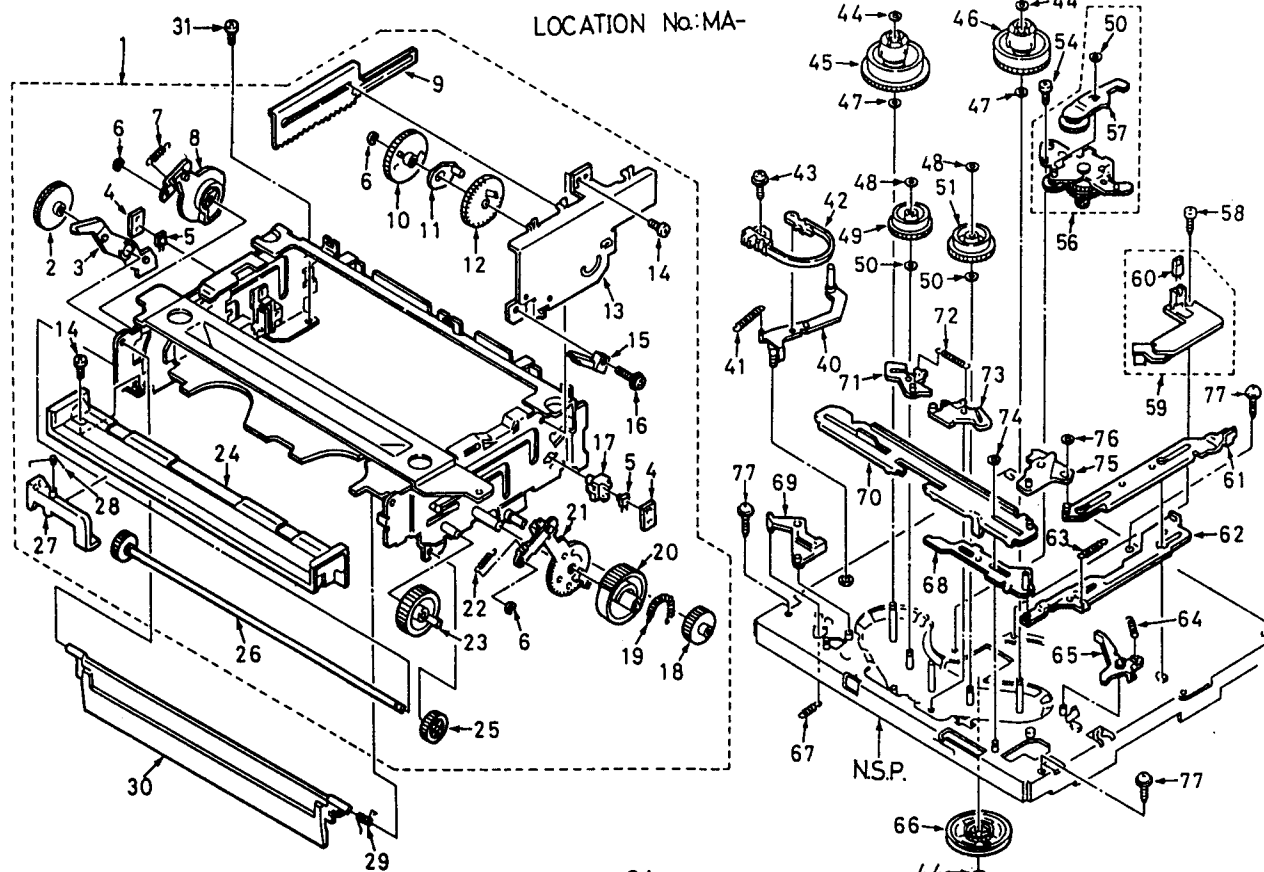
LOCATION No.:CH-
N.S.P.:Not available as service parts



8-2. MECHANISM PARTS 1

MA-1	COMPL,CASSETTE MECHA	613 087 4412
MA-2	GEAR, IDLER L	613 022 2572
MA-3	LEVER, DOOR OPENER	613 022 2275
MA-4	LID	613 022 0585
MA-5	PHOTO COUPLE PN150SAN	407 098 3201
MA-6	RING E 2.3	411 015 9801
MA-7	SPRING, LINK L	613 022 1643
MA-8	ASSY, GEAR, LEVER L	613 022 0073
MA-9	RACK	613 022 2695
MA-10	GEAR, LOCK	613 022 2633
MA-11	ASSY, LEVER, PINION	613 021 9916
MA-12	GEAR, PINION	613 022 2626
MA-13	ASSY, BRACKET, GEAR	613 021 9657
MA-14	SCR S-TPG BIN 2.6X4	411 027 1305
MA-15	SPECIAL SWITCH	613 006 4479
OR	SPECIAL SWITCH	613 095 0949
MA-16	SCR PAN+SW+W 2X9	411 106 9208
MA-17	HOLDER, TRANSISTOR	613 022 0936
MA-18	GEAR, IDLER	613 022 2619
MA-19	SPRING, GEAR MAIN	613 022 1667
MA-20	GEAR, MAIN	613 022 2596
MA-21	ASSY, GEAR, LEVER R	613 022 0097
MA-22	SPRING, LINK R	613 022 1674
MA-23	GEAR, IDLER R	613 022 2602
MA-24	BOARD, UNDER	613 022 4064
MA-25	GEAR, COUPLE R	613 022 2558
MA-26	ASSY, ROD	613 022 0226
MA-27	LEVER, SAFETY SW	613 022 2237
MA-28	SPRING, SAFETY SW	613 022 1827
MA-29	SPRING, DOOR	613 022 1803
MA-30	CASSETTE DOOR	613 099 4851
MA-31	SCR BIN 3X6	411 001 8702
MA-40	ASSY, LEVER, TENSION	613 100 0391
MA-41	SPRING, LEVER TENSION	613 085 7996
MA-42	ASSY, HOLDER, BAND	613 021 9701
MA-43	SCR PAN+SW+W 2.6X6	411 036 2805

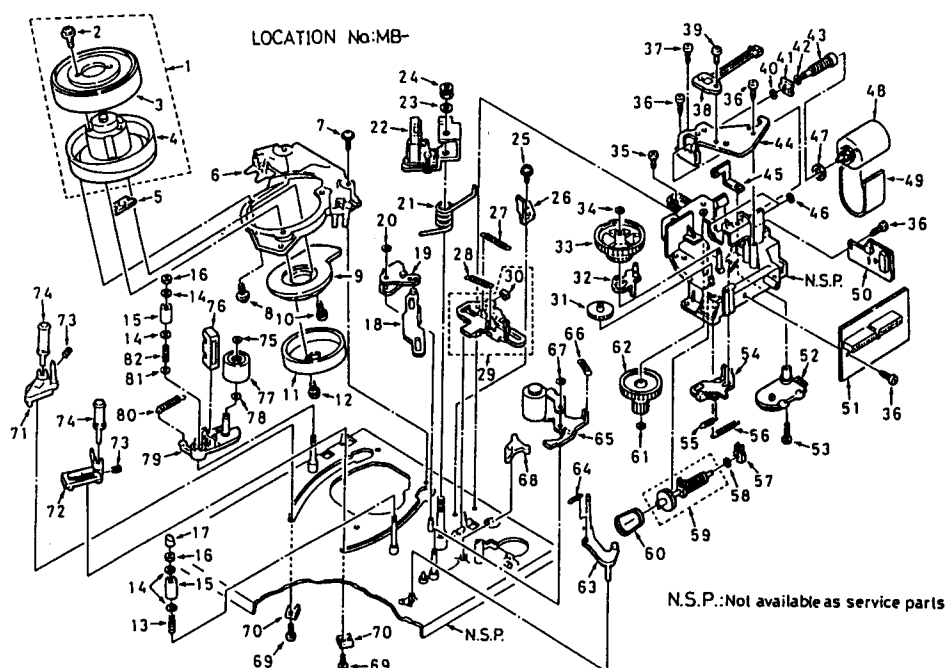
MA-44	WASHER Y 2.6X6X0.25	411 109 1605
MA-45	ASSY, REEL, SUPPLY	613 022 0127
MA-46	ASSY, REEL, TAKE UP	613 022 0110
MA-47	SPECIAL WASHER 3.1X6X0.3	412 021 5306
OR	SPECIAL WASHER 3.1X6X0.4	412 015 8900
OR	SPECIAL WASHER 3.1X6X0.5	412 015 8504
MA-48	WASHER Y 2.1X6X0.25	411 109 1506
OR	WASHER Y 2.1X5X0.25	411 109 1407
MA-49	GEAR, REEL SUPPLY	613 085 7231
OR	GEAR REEL SUPPLY	613 098 7174
MA-50	SPECIAL WASHER 2.6X6X0.25	412 026 7305
MA-51	GEAR, REEL TAKE UP	613 022 2480
OR	GEAR REEL TAKE UP	613 098 7181
MA-54	SCR BIN 2.6X4	411 031 0905
MA-56	COMPL, IDLER, CLUTCH	613 085 7101
MA-57	ASSY, IDLER	613 022 0134
MA-58	SCR S-TPG BIN 2.6X8	411 021 3107
MA-59	COMPL, MC-4	613 078 6302
MA-60	LED LN59	407 016 7205
MA-61	ASSY, SLIDE, ACT PLATE	613 021 9985
MA-62	ASSY, SLIDE, C BRAKE	613 021 9992
MA-63	SPRING, RETURN SLIDE	613 022 1612
MA-64	SPRING, SUB T	613 022 1506
MA-65	ASSY, BRAKE SUB T	613 098 0106
MA-66	PULLEY, REEL	613 077 3647
MA-67	SPRING, SUB SUPPLY	613 022 1490
MA-68	SLIDE, ACT BRAKE	613 022 2374
MA-69	BRAKE, SUB SUPPLY	613 084 8871
MA-70	ASSY, SLIDE, M PLATE	613 022 0004
MA-71	ASSY, BRAKE, SUPPLY	613 080 9216
MA-72	SPRING, MAIN BRAKE	613 022 1544
OR	SPRING, MAIN BRAKE	613 086 2914
MA-73	ASSY, BRAKE, TAKE UP	613 080 9209
MA-74	WASHER Y 2.6X5X0.5	411 109 3005
MA-75	LEVER, CONT PLATE	613 022 2015
MA-76	WASHER Y 2.1X5X0.25	411 109 1407
OR	WASHER Y 2.1X5X0.3	411 109 2503
MA-77	SCR S-TPG BIN 4X12	411 021 7907



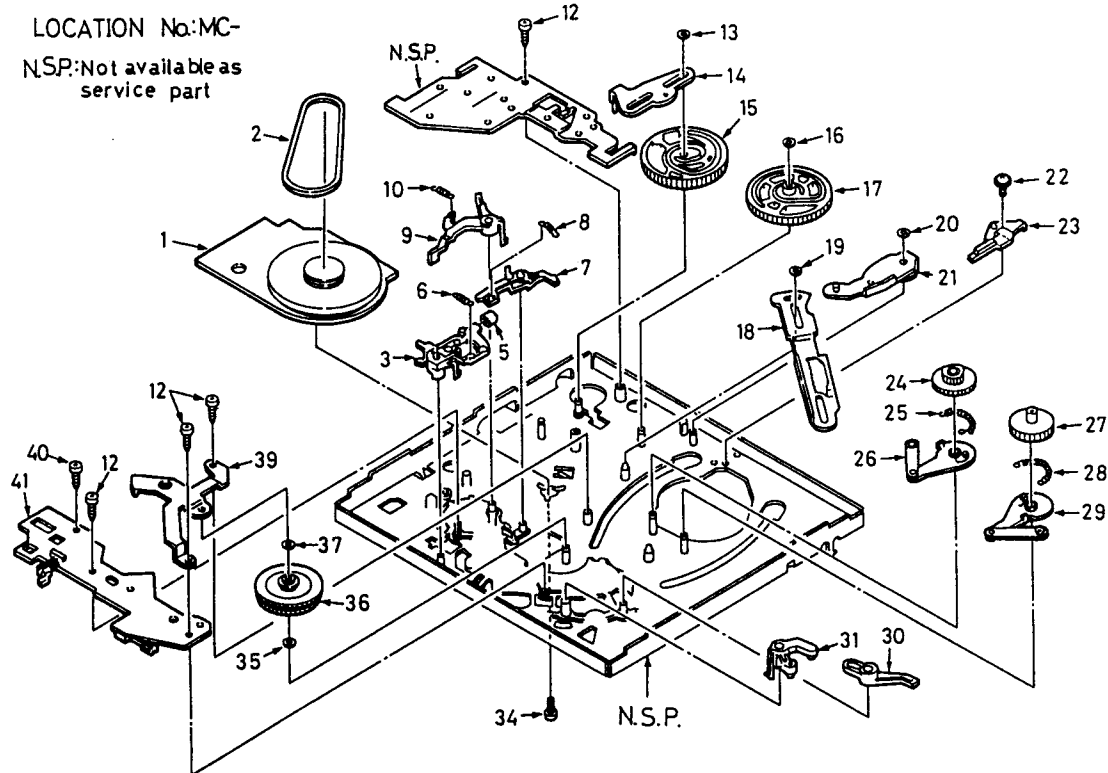
8-3. MECHANISM PARTS 2

MB-1	COMPL.CYLINDER,2N2P-V	613 078 8665
OR	COMPL.CYLINDER,2N2P-V	613 087 6843
MB-2	SCR PAN+W 3X8	411 038 1608
MB-3	ASSY.CYLINDER,UPR 2N2P-V	613 078 8672
OR	ASSY.CYLINDER,UPR 2N2P-V	613 087 6850
MB-4	ASSY.CYLINDER,LWR 2	613 022 0271
OR	ASSY.CYLINDER,LWR 2	613 077 2138
MB-5	SPACER,MOTOR	613 081 4036
MB-6	BASE,CYLINDER	613 022 1001
OR	BASE,CYLINDER	613 088 9072
MB-7	SCR PAN+FLG 3X6	411 047 7509
MB-8	SCR PAN+FLG 2.6X8	411 047 5000
OR	SPECIAL SCREW 2.6X8	412 030 9708
MB-9	STATOR,MOTOR CYL	613 085 7279
MB-10	SCR PAN+SW 2.3X10	411 044 8301
OR	SCR PAN+SW 2.3X8	411 044 9209
MB-11	ROTOR,MOTOR CYL	613 022 4019
MB-12	SCR PAN+SW 2.3X6	411 044 9001
MB-13	SPRING,ADJUST GUIDE	613 022 1766
MB-14	SPECIAL WASHER	613 053 3227
MB-15	TAPE GUIDE	613 058 3307
MB-16	SPECIAL NUT (M3)	412 026 2607
MB-17	CAP	613 085 2434
MB-18	ASSY.SLIDE,ACT PINCH	613 021 9961
MB-19	ASSY.LEVER,CAM PINCH	613 021 9800
MB-20	WASHER Y 3.1X8X0.5	411 109 2008
MB-21	SPRING,ACE HEAD	613 022 1797
MB-22	COMPL.BRACKET,HEAD	613 021 9640
MB-23	SPACER	613 051 4615
MB-24	SPECIAL NUT (M5)	412 015 8207
MB-25	SCR PAN+SW+W 2.6X5	411 120 0007
MB-26	BRACKET,STOPPER	613 022 0752
MB-27	SPRING,LINK LOCK	613 022 1575
MB-28	SPRING,SLIDE BRAKE	613 022 1582
MB-29	ASSY.SLIDE,CAM	613 022 0059
MB-30	DAMPER	613 022 2725
MB-31	GEAR,FRONT LOAD	613 022 2534
MB-32	ASSY.LEVER,FRONT	613 094 1206
MB-33	GEAR,HELICAL FRONT	613 077 3586
MB-34	WASHER 4.1X6.5XR5T	613 027 0504
MB-35	SCR PAN+SW+W 2.6X6	411 046 8002
MB-36	SCR S-TPG PAN 2.6X6	411 023 2801
MB-37	SCR S-TPG BIN 2.6X8	411 021 3107
MB-38	ASSY.SENSOR,DEW	613 089 4328

MB-39	SCR PAN 2.6X5	411 040 2303
MB-40	SPECIAL WASHER	613 053 2381
MB-41	HOLDER,WORM	613 077 3227
MB-42	WASHER 2.1X4X0.25	613 027 0382
MB-43	ASSY,WORM,FRONT	613 078 8320
MB-44	BRACKET,HOLDER	613 092 5862
MB-45	PLATE,NUT	613 093 9159
MB-46	DAMPER,MOTOR	613 093 8374
MB-47	DAMPER,WORM	613 077 3616
MB-48	ASSY.LOADING MOTOR	613 021 9527
MB-49	DAMPER,MOTOR	613 092 9945
MB-50	COMPL.PCB MC-3	613 092 2588
MB-51	COMPL.PCB,MC-2	613 095 6033
MB-52	ROTARY SWITCH	613 077 4361
MB-53	SCR PAN 2.6X13	411 126 5303
MB-54	ASSY.SLIDE,FRONT	613 092 9921
MB-55	SPRING,LEVER LOAD	613 092 5985
MB-56	SPRING,LEVER ACT	613 092 5992
MB-57	HOLDER,WORM	613 092 5886
MB-58	WASHER 2.1X6X0.5	613 027 0627
MB-59	ASSY,WORM,LOAD	613 092 9938
MB-60	BELT,LOADING,RUBBER,1.8X1.8	613 022 2985
MB-61	WASHER SLIT 2.6X5X0.50	412 033 4106
MB-62	GEAR,HELICAL	613 077 3579
MB-63	ASSY.LEVER,REV GUIDE	613 021 9886
OR	ASSY.LEVER,REV GUIDE	613 102 9286
MB-64	SPRING,REVIEW LEVER	613 022 1568
MB-65	COMPL,PINCH ROLLER	613 022 0158
MB-66	SPRING,PINCH ROLLER	613 022 1483
MB-67	WASHER Y 3.6X6X0.5	411 109 2107
MB-68	COMPL,LEVER,ACT BRAKE	613 081 1271
MB-69	SCR BIN 2.6X5	411 031 1209
MB-70	PLATE,GUIDE	613 022 1919
MB-71	ASSY,BASE,ROLLER S	613 021 9725
MB-72	ASSY,BASE,ROLLER T	613 021 9732
MB-73	SCR SET HEX-SCT 2X3	411 063 0904
MB-74	ASSY,GUIDE,ROLLER	613 022 0233
MB-75	WASHER Y 1.5X4X0.25	411 109 2602
MB-76	HEAD,FULL ERASE	613 022 4224
MB-77	ROLLER,IMPEDANCE	613 080 6703
OR	ROLLER,IMPEDANCE	613 022 2817
MB-78	SPECIAL WASHER 2.1X5X0.13	412 032 5807
MB-79	ASSY.LEVER,FE HEAD	613 093 8305
MB-80	SPRING,ERASE HEAD	613 022 1698
MB-81	WASHER Y 6.4X10X0.25	411 109 1704
MB-82	SPRING,GUIDE SUPPLY	613 022 1773



LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.	LOCATION	DESCRIPTION	RS PARTS NO.	MFR.PARTS NO.
8-4. MECHANISM PARTS 3				MC-21	ASSY, LEVER, CAM LOAD	613 021 9794	
MC-1	MOTOR, CAPSTAN	613 087 8854		MC-22	SCR PAN+FLG 3X4	411 047 6809	
MC-2	BELT, REEL DRIVE, RUBBER, 2.0X2.0	613 022 2978		MC-23	ASSY, EARTH, CYL	613 021 9763	
MC-3	ASSY, LEVER, CLUTCH	613 021 9848		MC-24	GEAR, LOAD TAKE UP	613 022 2435	
MC-5	DAMPER, LEVER CLUTCH	613 079 1023		OR	GEAR, LOAD TAKE UP	613 090 6380	
MC-6	SPRING, LEVER CLUTCH	613 022 1520		MC-25	SPRING, GEAR LOAD T	613 022 1551	
MC-7	LEVER, CHANGE CLUTCH	613 082 3434		MC-26	ASSY, LEVER, LOAD T	613 021 9879	
MC-8	SPRING, CHANGE CLUTCH	613 022 1711		MC-27	GEAR, LOAD SUPPLY	613 022 2428	
MC-9	ASSY, BRAKE CAPSTAN	613 088 5470		OR	GEAR, LOAD SUPPLY	613 090 6373	
MC-10	SPRING, CAPSTAN	613 092 7156		MC-28	SPRING, GEAR LOAD S	613 022 1704	
MC-12	SCR S-TPG BIN 2.6X8	411 021 3107		MC-29	ASSY, LEVER, LOAD S	613 021 9862	
MC-13	WASHER Y 3.1X8X0.5	411 109 2008		MC-30	LEVER, RETURN TENSION	613 022 2039	
MC-14	ASSY, SLIDE, CAM PLATE	613 021 9978		MC-31	ASSY, LEVER CONTROL	613 091 3104	
MC-15	CAM, MODE	613 022 2701		MC-34	SCR PAN 2.6X5	411 040 2303	
MC-16	WASHER Y 3.1X6X0.5	411 109 1902		MC-35	SPECIAL WASHER 3.1X6X0.25	412 015 8603	
MC-17	CAM, MAIN	613 022 2718		MC-36	ASSY, GEAR, FRICTION	613 102 0900	
MC-18	RACK, LOAD	613 022 2664		MC-37	WASHER Y 2.6X6X0.25	411 109 1605	
MC-19	WASHER Y 2.6X6X0.5	411 109 1803		MC-39	BRACKET, PULLEY	613 079 8121	
MC-20	WASHER Y 3.6X6X0.5	411 109 2107		MC-40	SCR S-TPG BIN 2.6X5	411 100 0300	
OR	WASHER Y 3.6X8X0.5	411 109 2206		MC-41	COMPL, MC-1	613 077 9489	



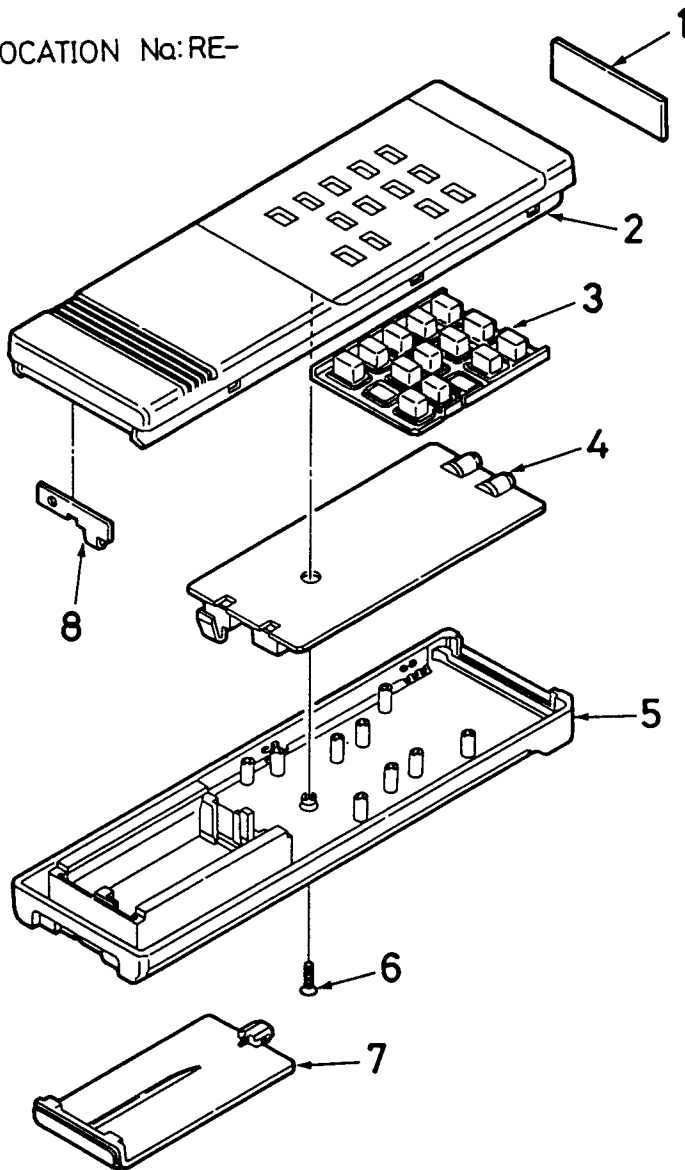
8-5. REMOCON UNIT

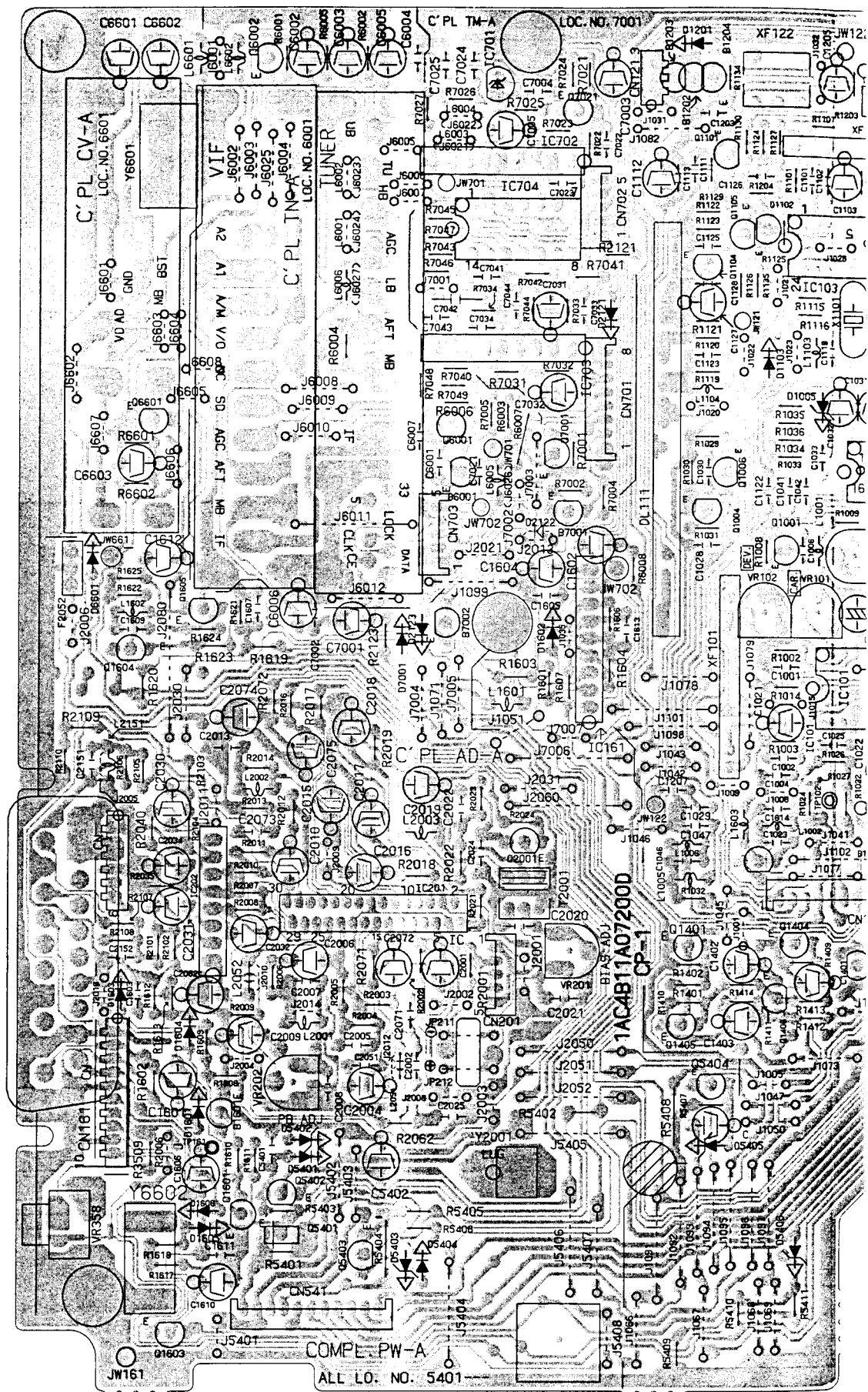
RE-1	SIGN WINDOW	613 040 5180
RE-2	ASSY,CABINET, TOP	613 101 7788
RE-3	BUTTON	613 084 7171
RE-4	COMPL,RM-1	613 080 0022
RE-5	BOTTOM LID	613 040 0468
RE-6	SCR S-TP6 FLT 2.6X10	411 101 7308
RE-7	BATTERY LID	613 040 1618
RE-8	TERMINAL	613 052 5321

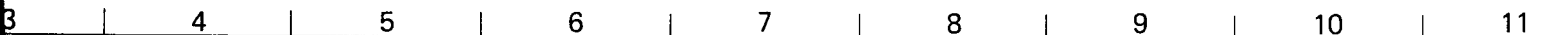
8-6. ACCESSORIES

REMOCON	613 097 2248
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LOCATION No:RE-









1

H

G

F

E

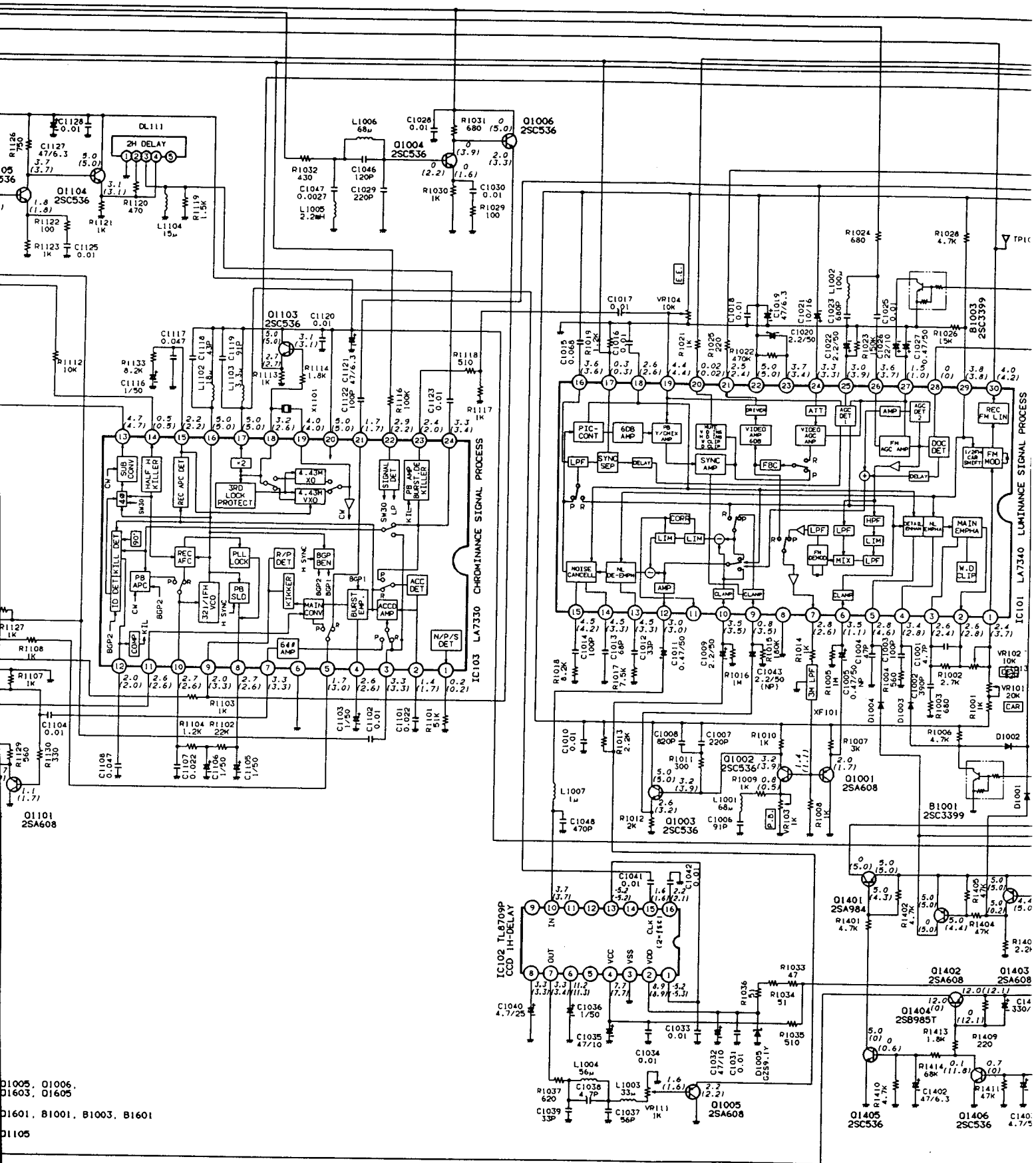
D

C

B

A

9-2. COMPL. CP-A (VD-A) VIDEO CIRCUIT DIAGRAM



CODES : GMA01 or ISS133



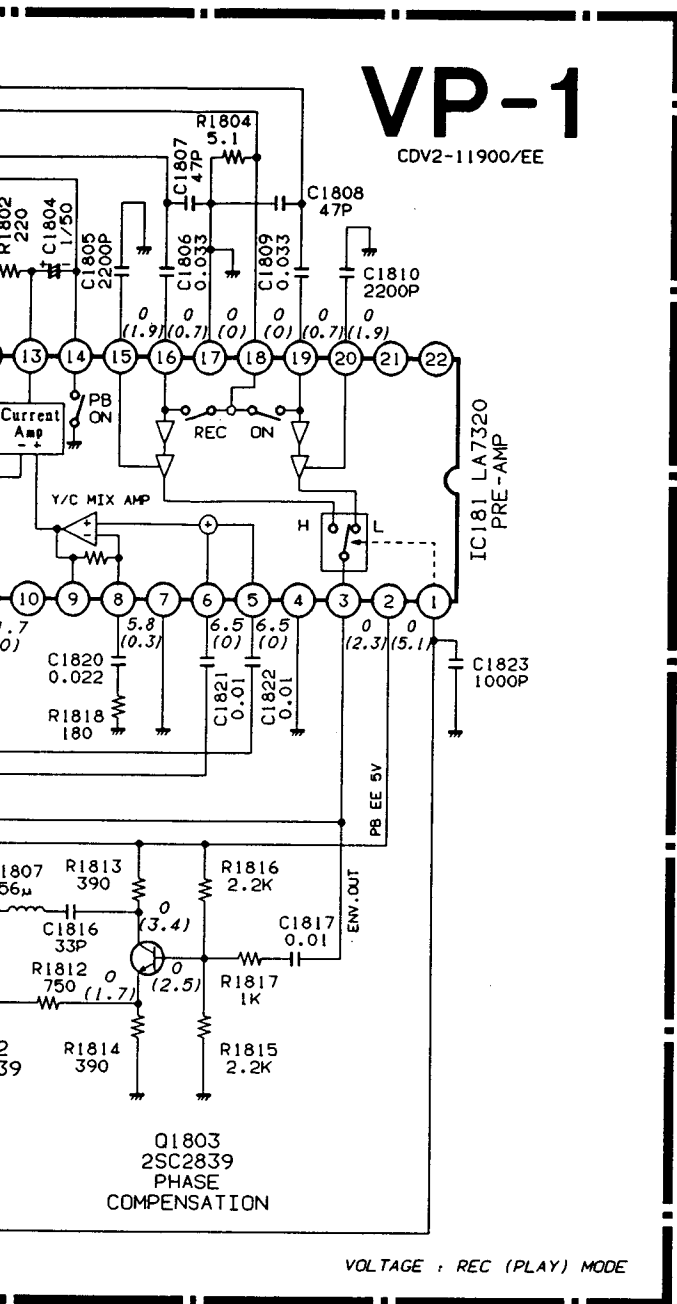


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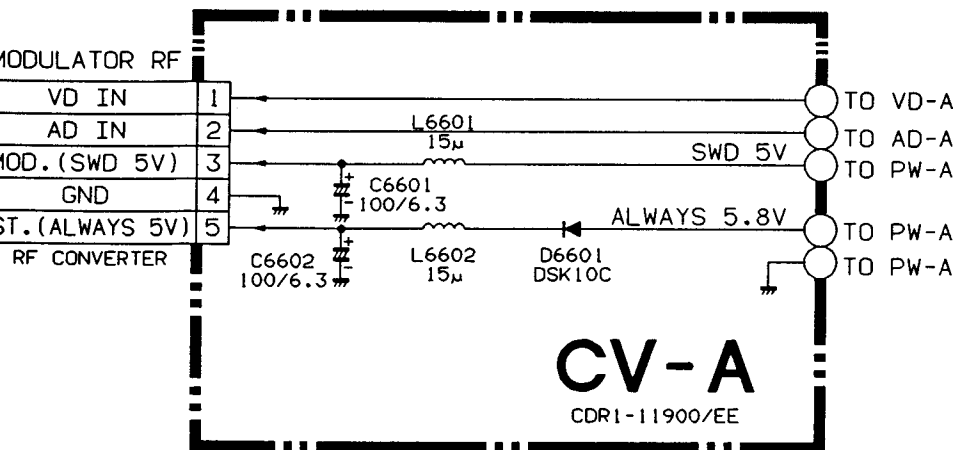


	F
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A



5. COMPL. CP-A (CV-A) RF CONVERTER CONNECTION CIRCUIT DIAGRAM

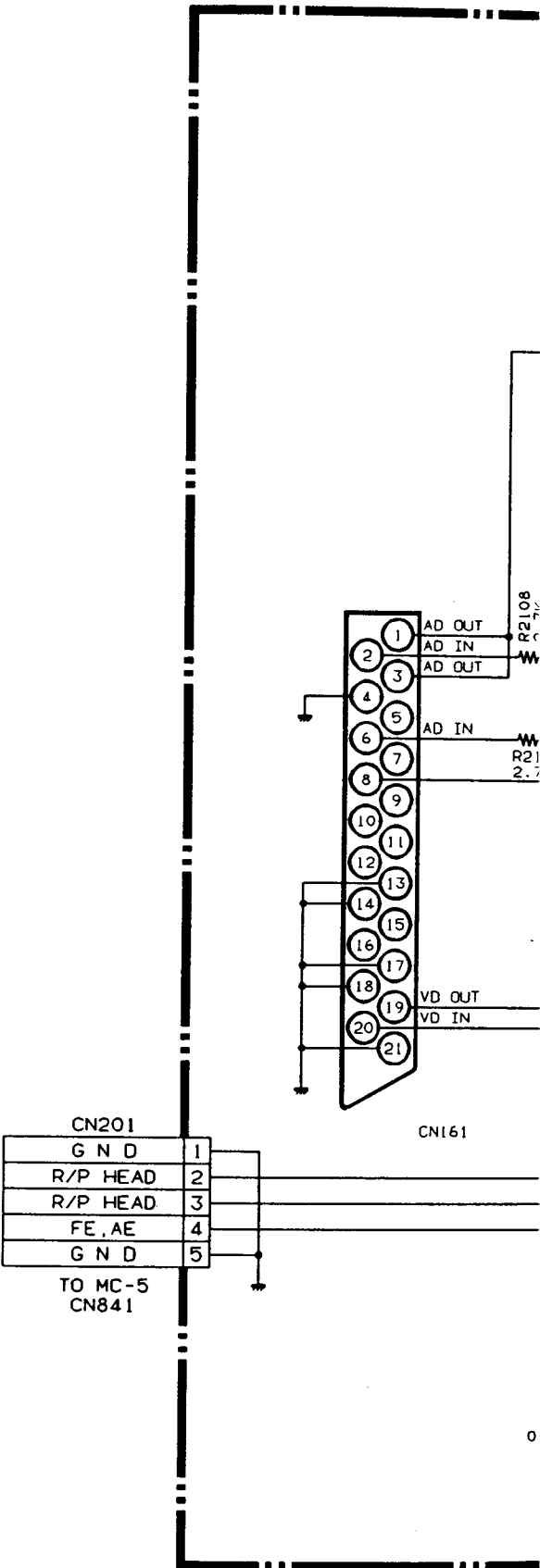


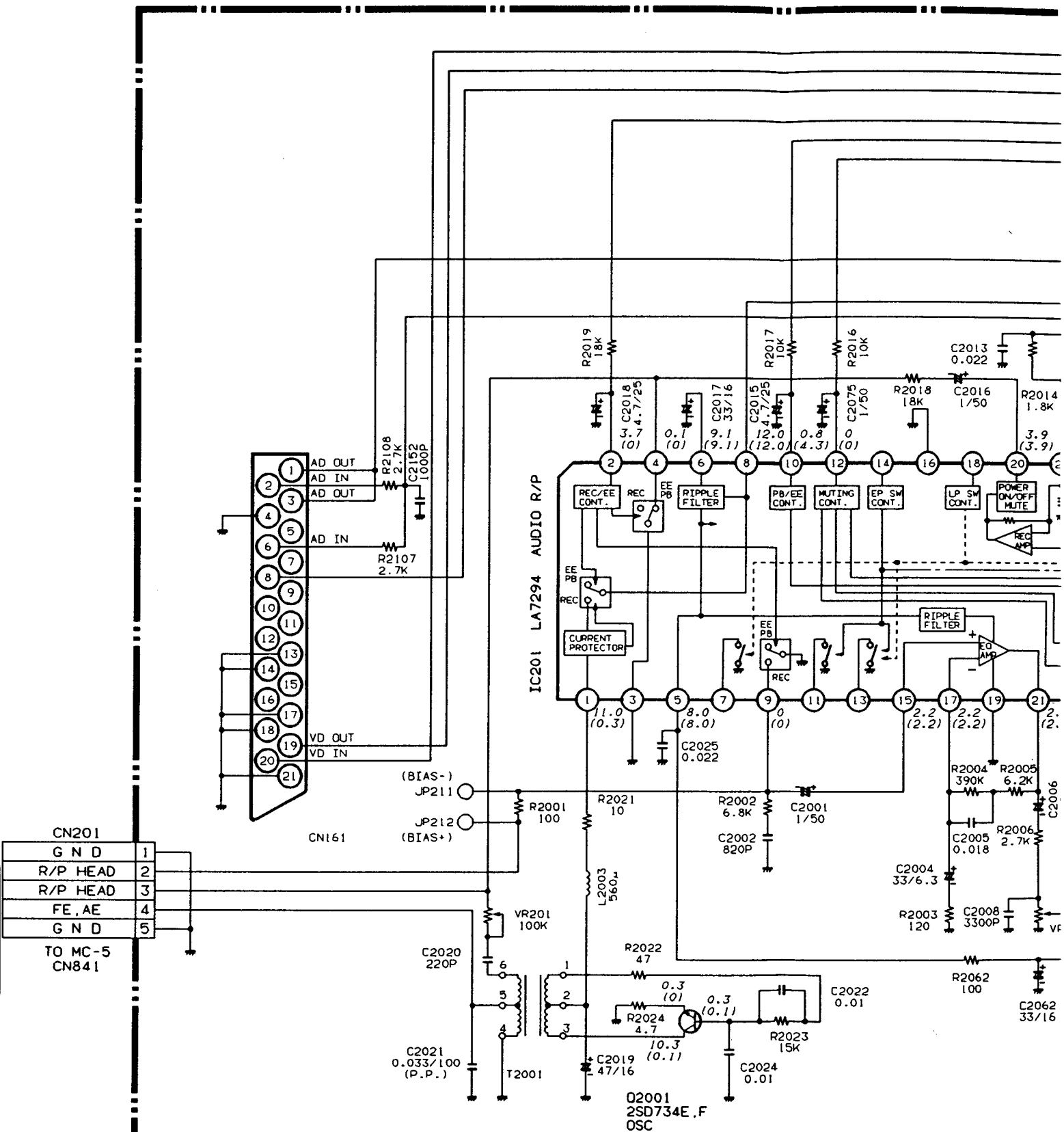
9-6. WAVEFORM OF VIDEO CIRCUIT

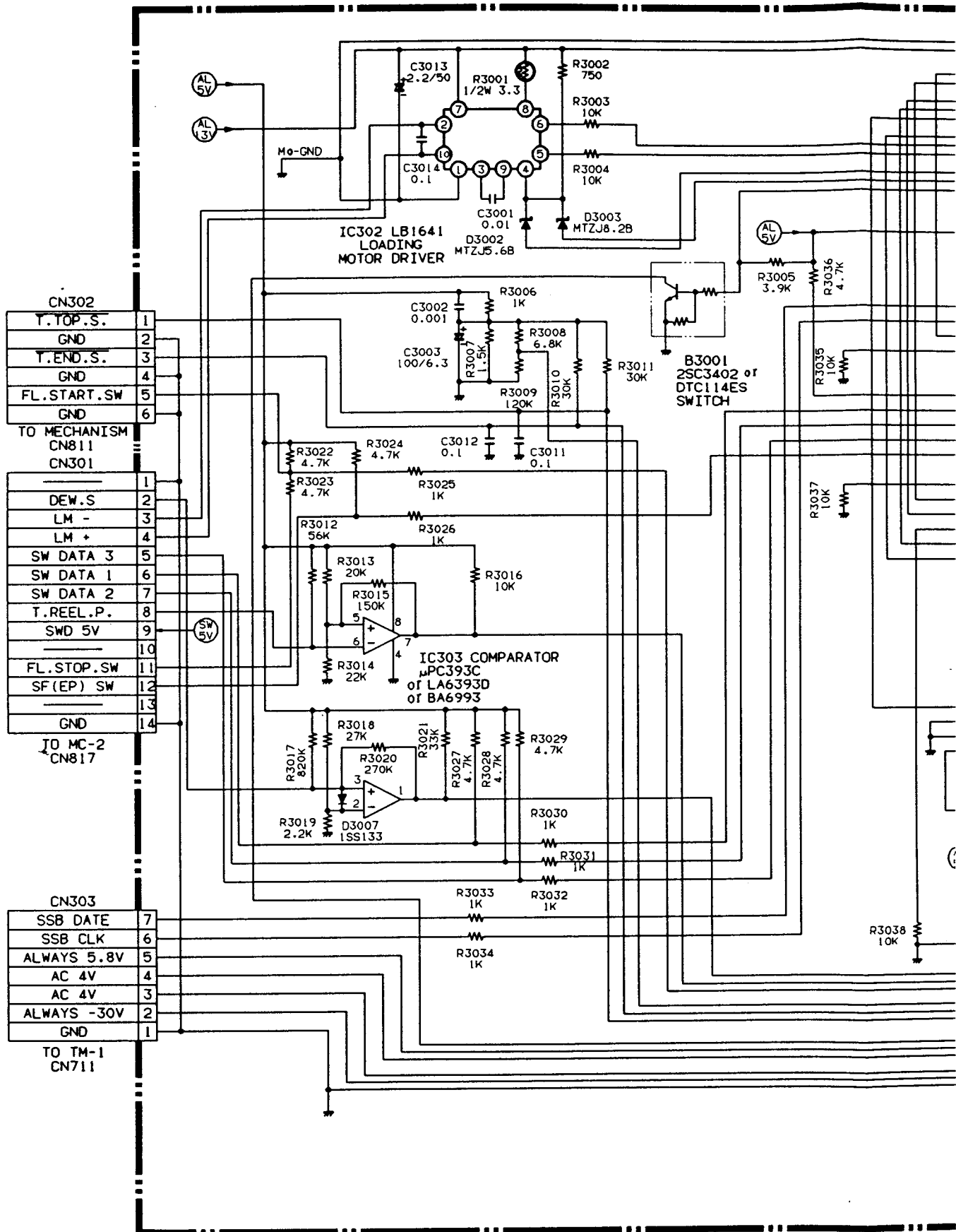
Pin No.		
IC101 (2)		REC 1.2 Vp-p (200 mV)
(6)		REC 500 m V _p (100 mV)
(6)		PLAY 300 m V _p (100 mV)
(9) (10)		PLAY 500 m V _p (100 mV)
(17)		4 Vp-p 15.625 K (1 V/div)
(19)		PLAY 320 m V _p (100 mV)
(26)		PLAY 400 m V _p (100 mV)
(30)		REC 1.5 Vp-p (500 mV)
TP161		PLAY 1 Vp-p (200 mV)

9-6. WAVEFORM OF VIDEO CIRCUIT

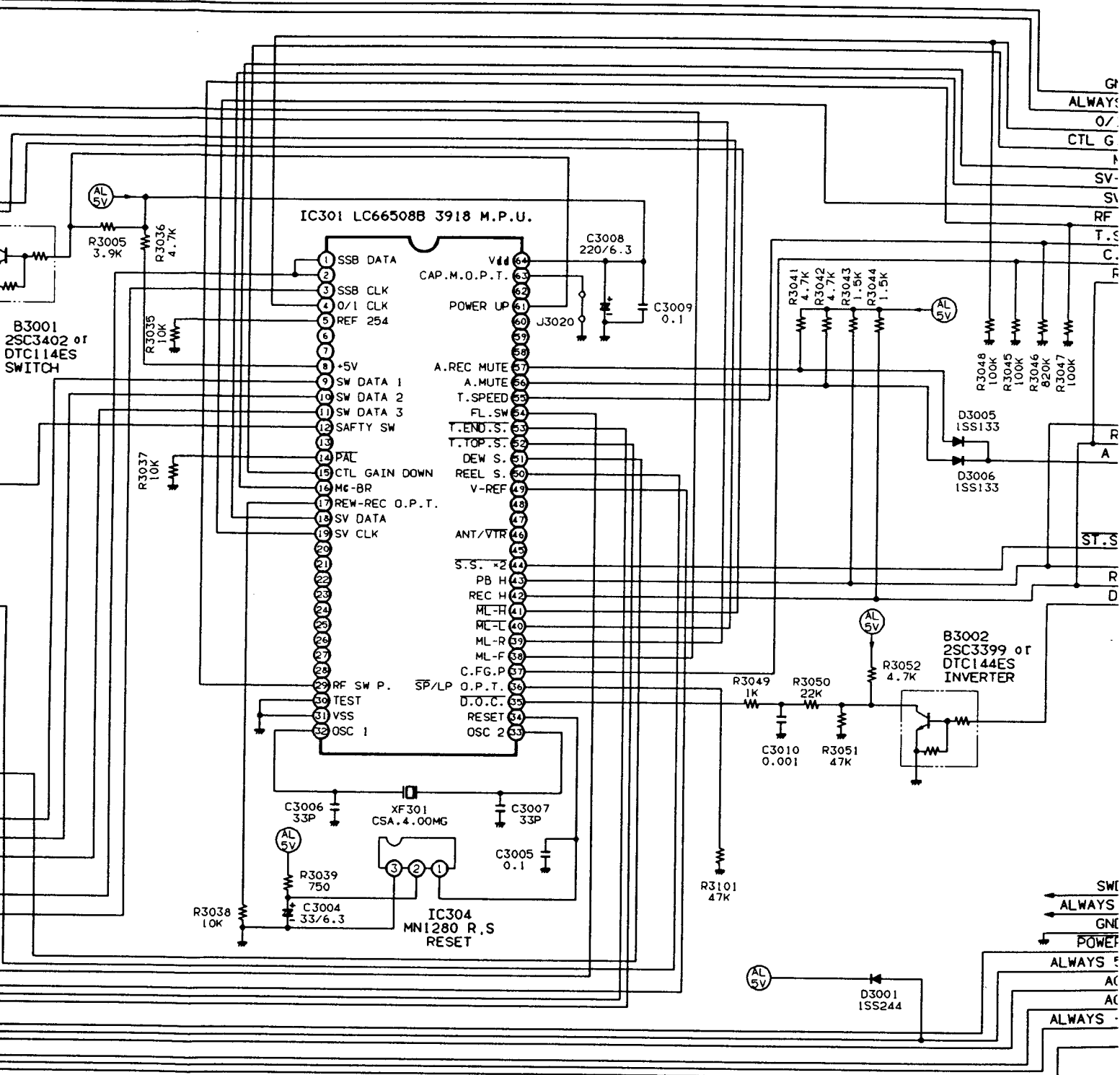
Pin No.		
IC101 (2)		REC 1.2 Vp-p (200 mV/div)
(6)		REC 500 m Vp-p (100 mV/div)
(6)		PLAY 300 m Vp-p (100 mV/div)
(9) (10)		PLAY 500 m Vp-p (100 mV/div)
(17)		4 Vp-p 15.625 KHz (1 V/div)
(19)		PLAY 320 m Vp-p (100 mV/div)
(26)		PLAY 400 m Vp-p (100 mV/div)
(30)		REC 1.5 Vp-p (500 mV/div)
TP161		PLAY 1 Vp-p (200 mV/div)







MPL CP-A (SY-A) SYSTEM CONTROL CIRCUIT DIAGRAM



SY-A

CDY1-11900B/EE

7

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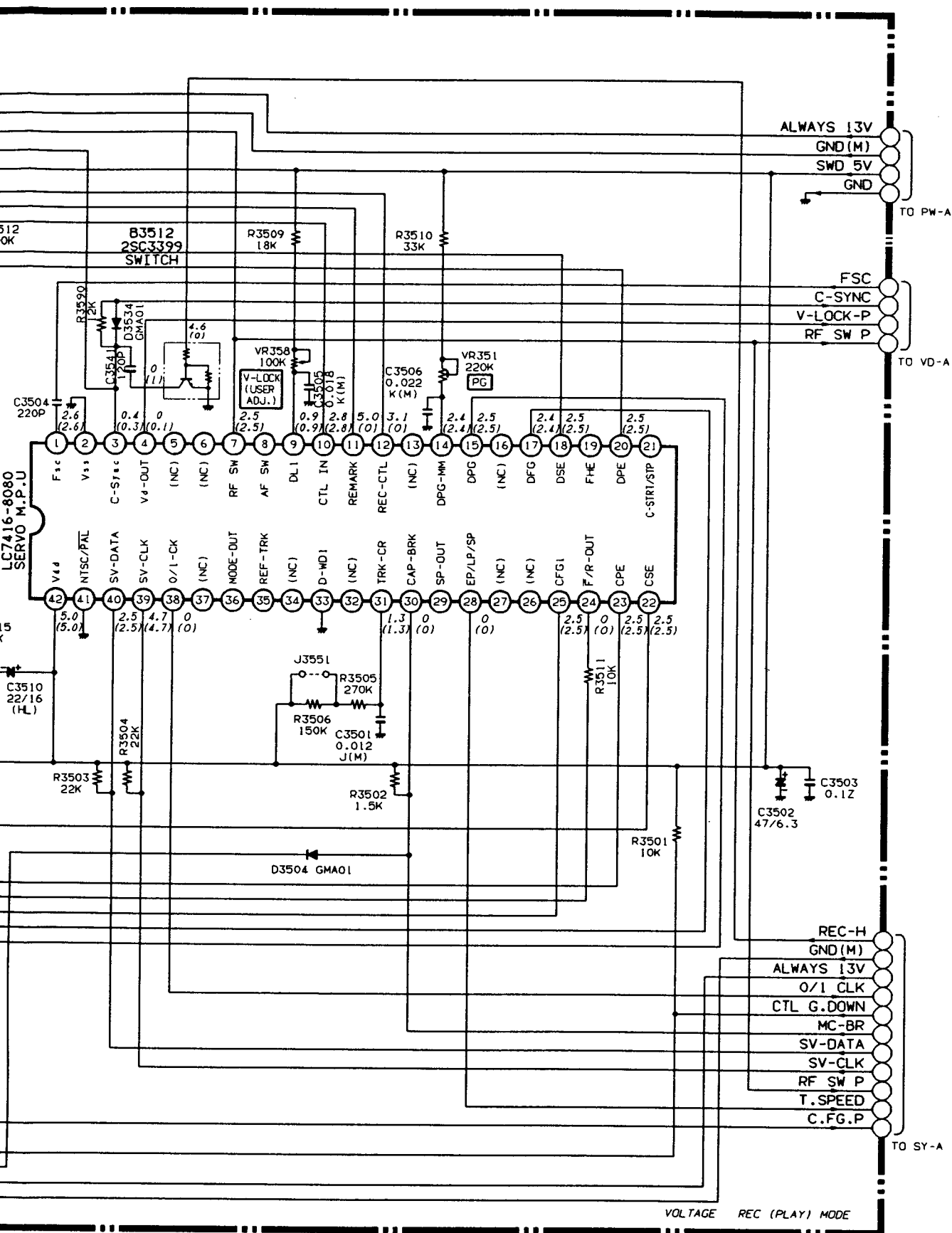
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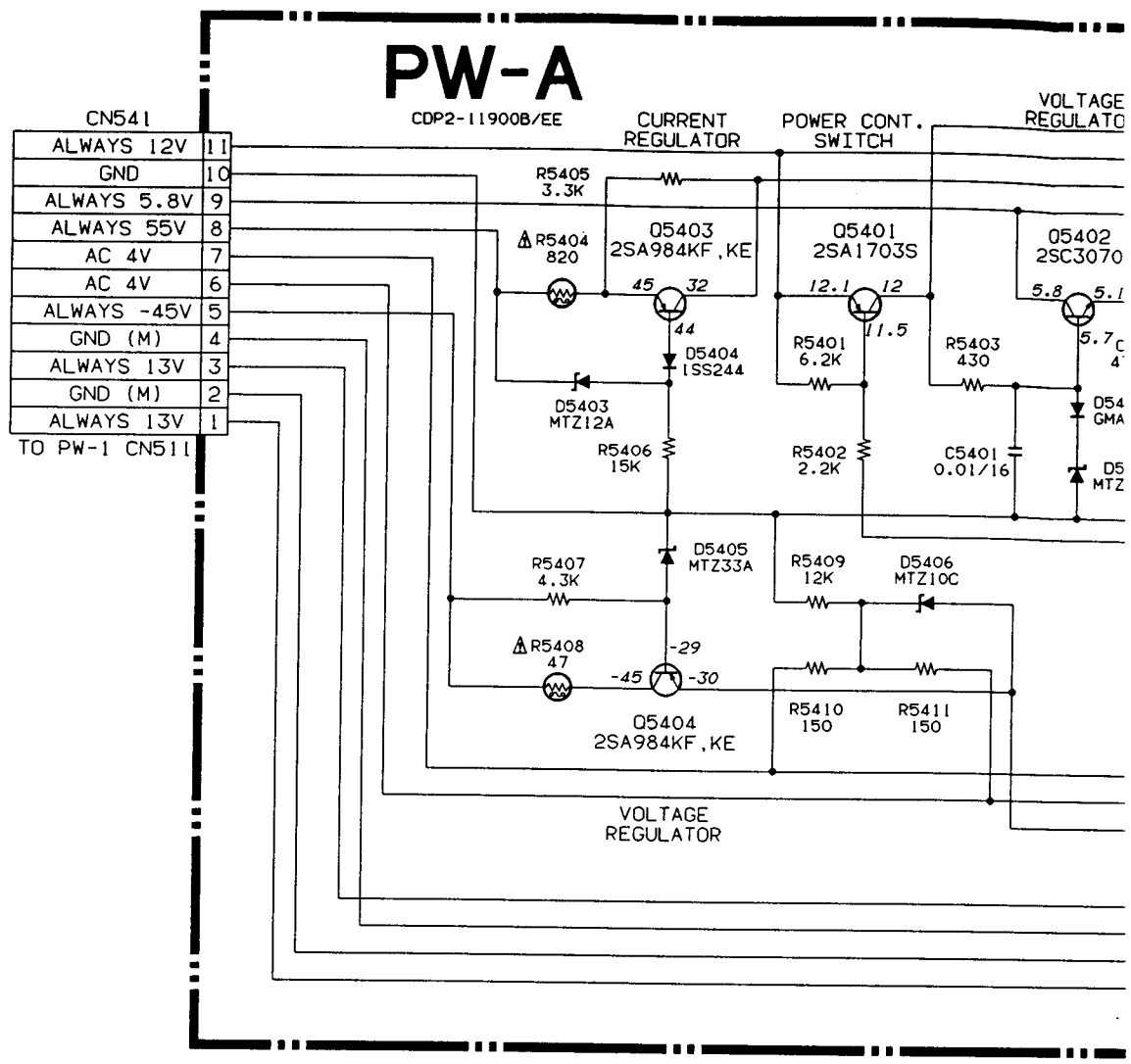
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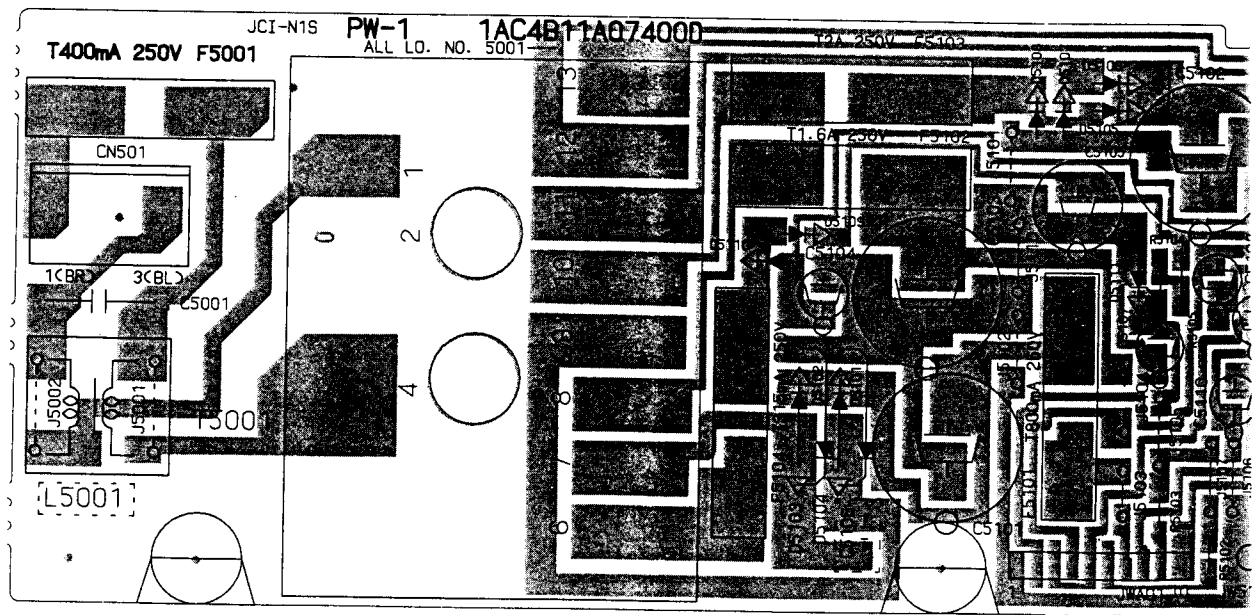
14

A) SERVO CIRCUIT DIAGRAM

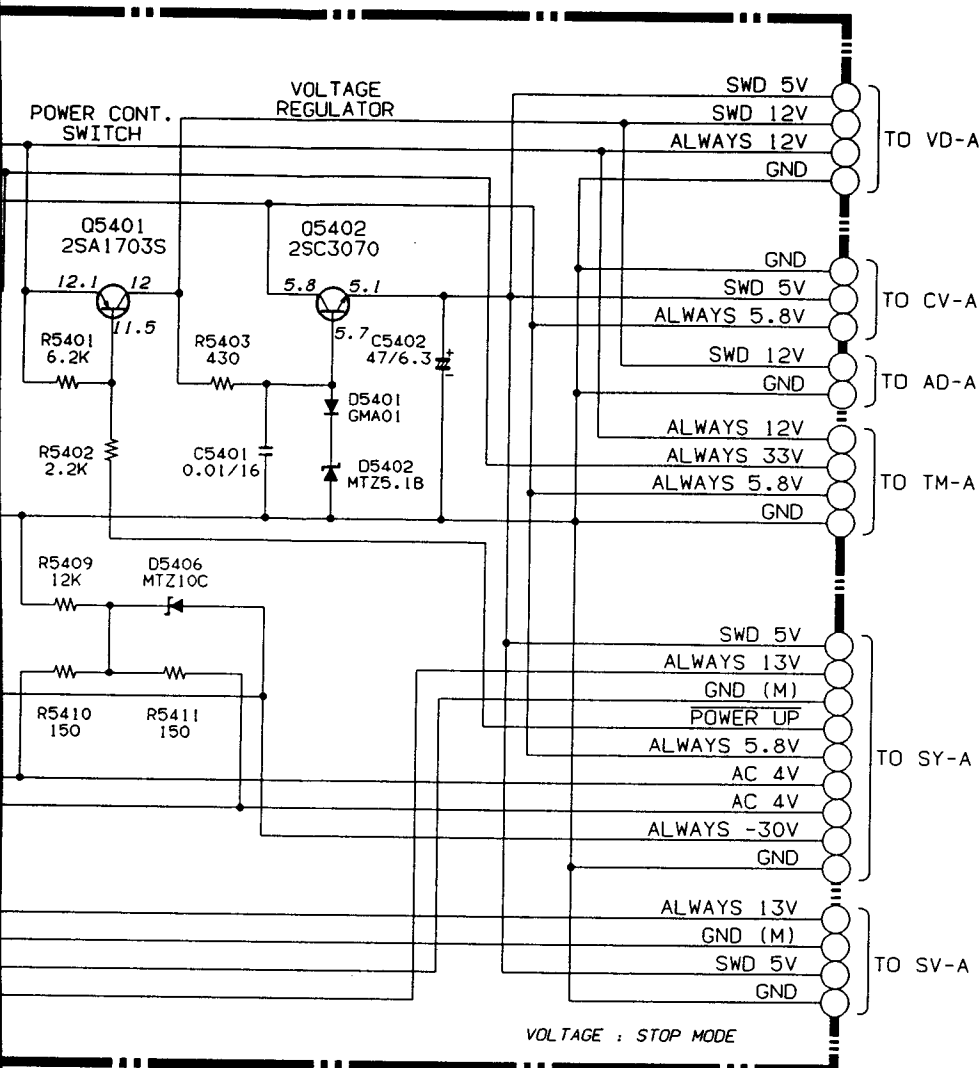




9-11. PW-1 POWER SUPPLY P.C.B.

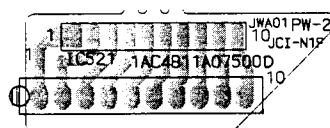
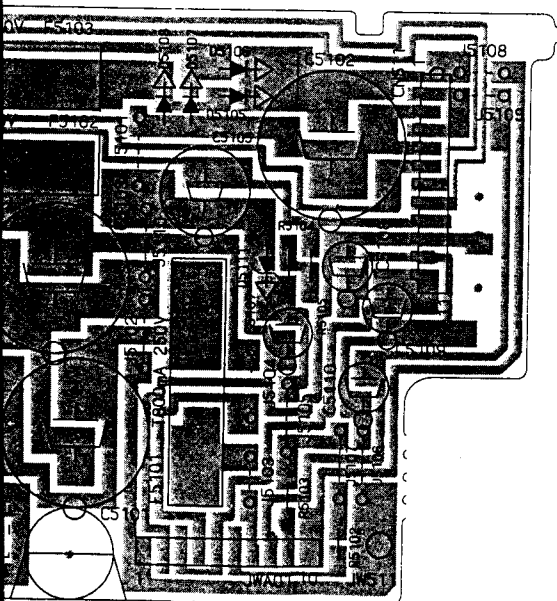


A) POWER SUPPLY CIRCUIT DIAGRAM



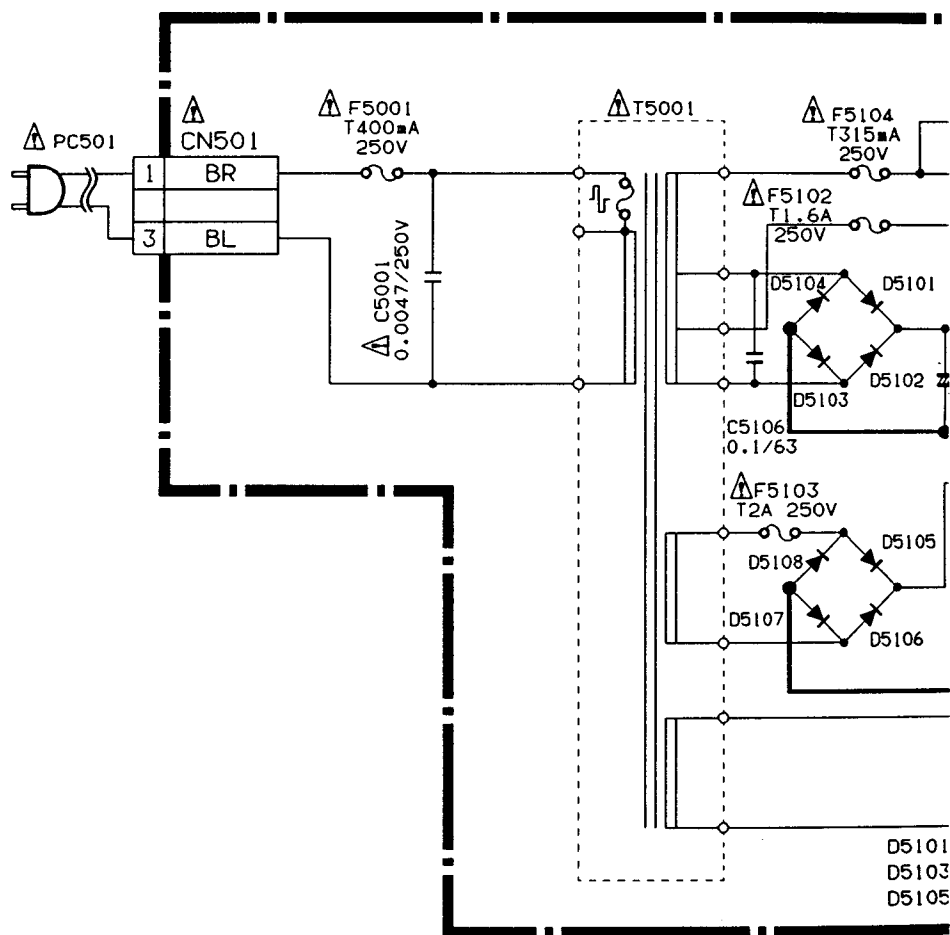
P.C.B.

9-12. PW-2 POWER SUPPLY P.C.B.

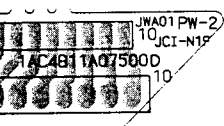


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Oxfordshire, OX9 4QY.
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Fax (01844) 352554

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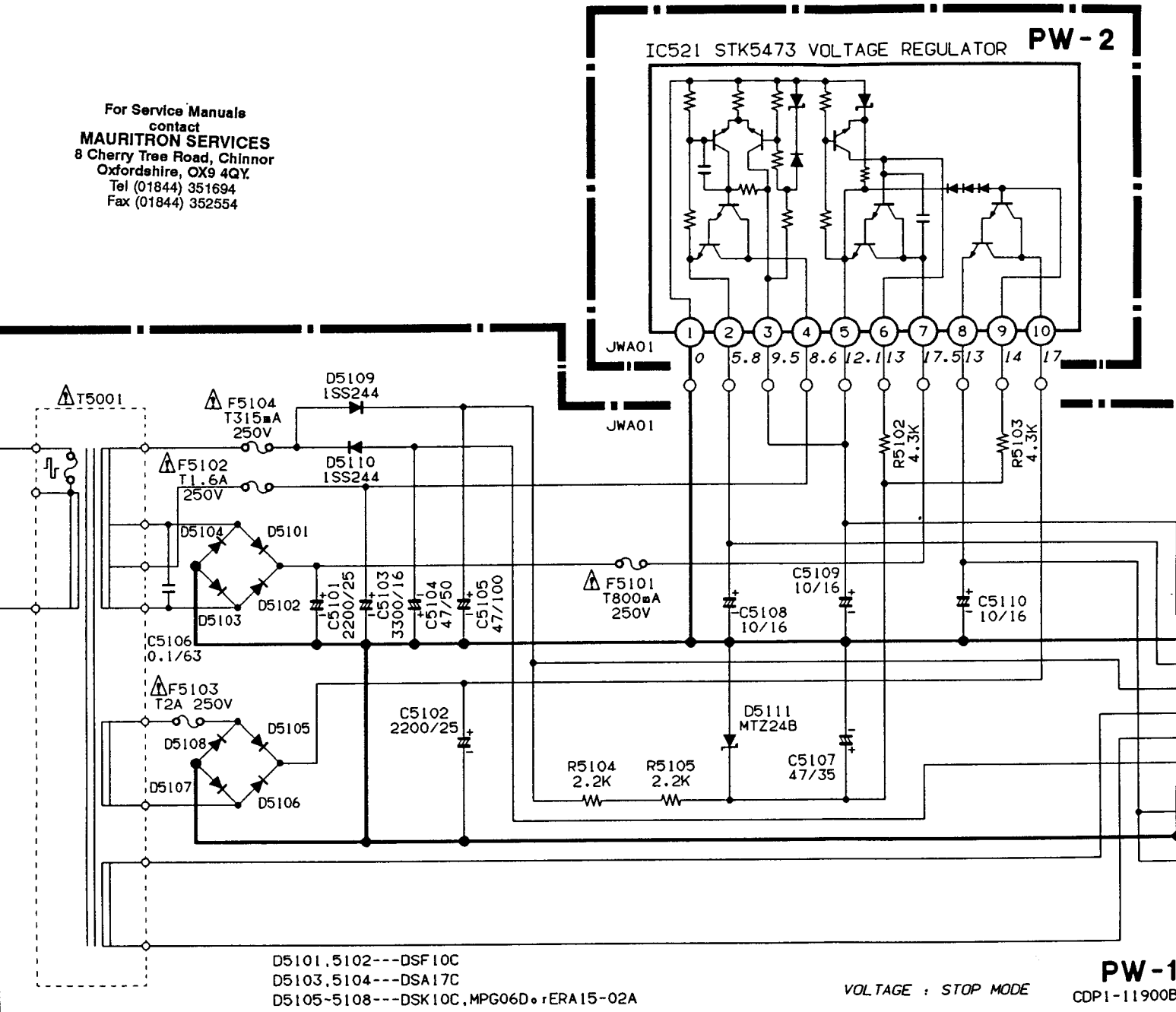
POWER SUPPLY P.C.B.



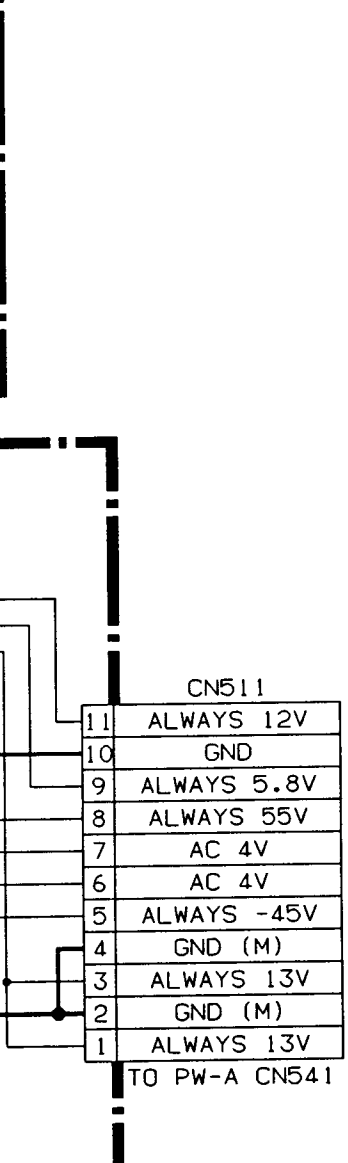
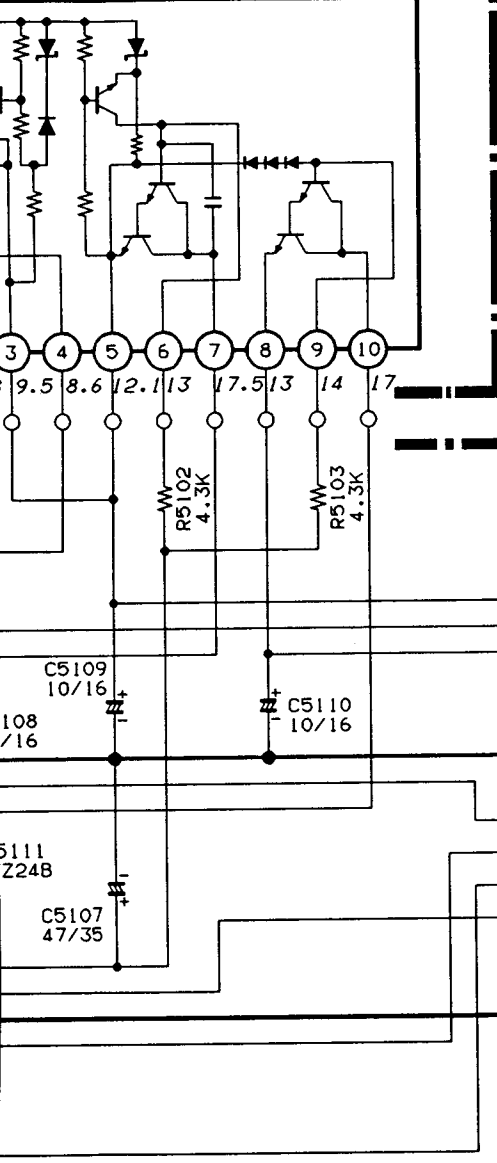
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9-13. COMPL. PW-1 & COMPL. PW-2 POWER SUPPLY CIRCUIT DIAGRAM

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473 VOLTAGE REGULATOR **PW-2**

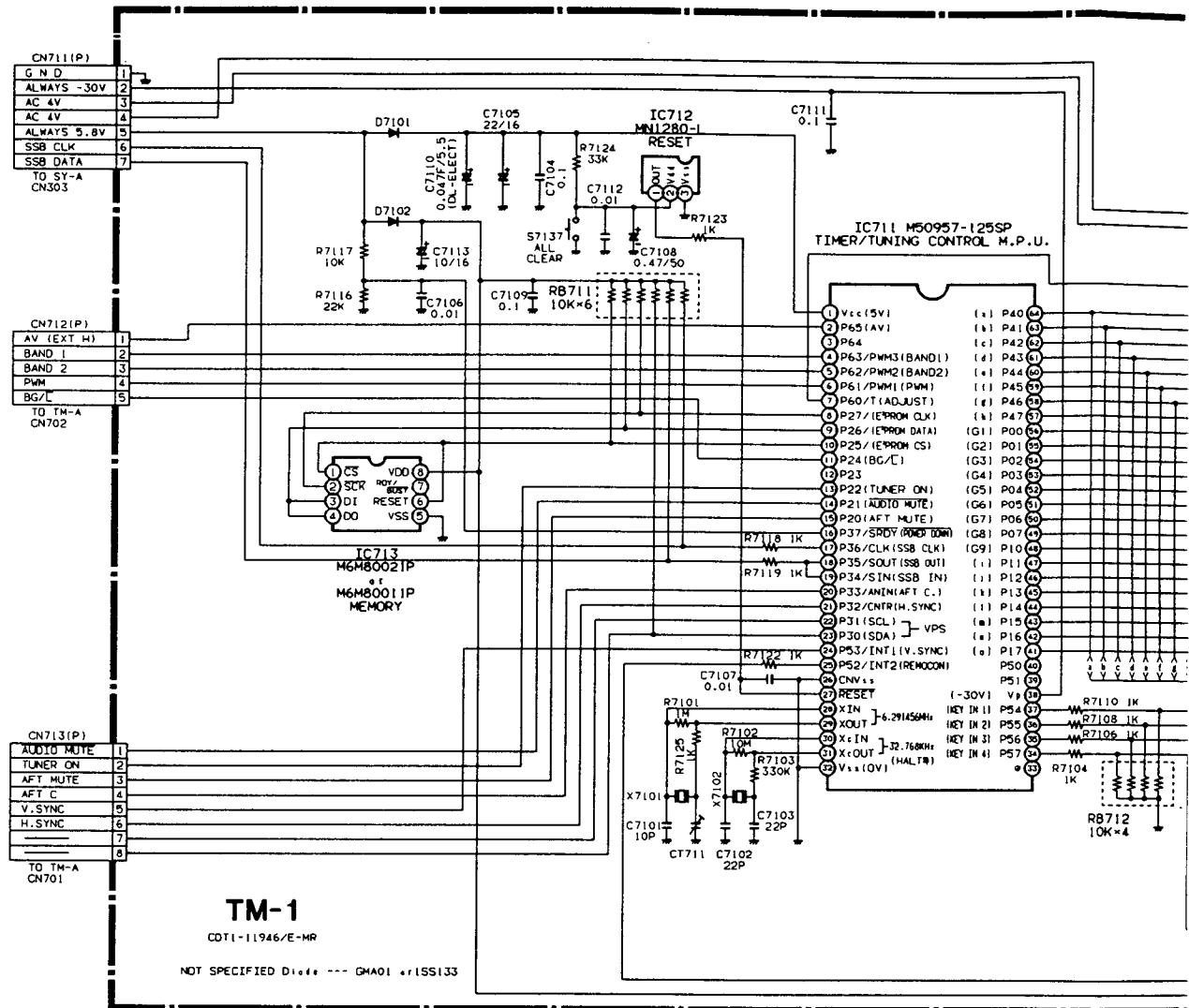


Pin	Signal
11	ALWAYS 12V
10	GND
9	ALWAYS 5.8V
8	ALWAYS 55V
7	AC 4V
6	AC 4V
5	ALWAYS -45V
4	GND (M)
3	ALWAYS 13V
2	GND (M)
1	ALWAYS 13V

TO PW-A CN541

PW-1 VOLTAGE : STOP MODE CDP1-11900B/EE

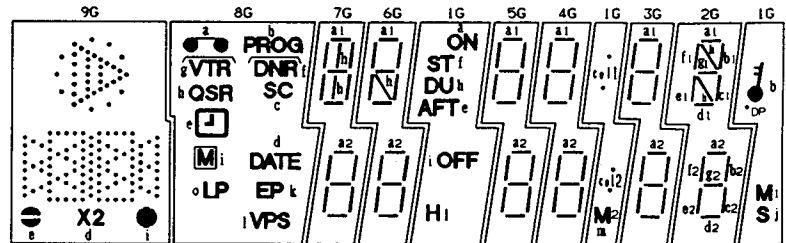
9-14. COMPL. TM-1 DISPLAY, TIMER & TUNING CON COMPL. TM-2 IR RECEIVER & EJECT SWITCH (



ANODE CONNECTION

	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	-	●	a1	a1	a1	a1	a1	a1	DN
b	-	PROG.	b1	b1	b1	b1	b1	b1	1
c	-	SC	c1	c1	c1	c1	c1	c1	DP
d	×2	DATE	d1	d1	d1	d1	d1	d1	M(1)
e	●	QSR	e1	e1	e1	e1	e1	e1	AFT
f	-	DNR	f1	f1	f1	f1	f1	f1	ST
g	-	VTR	g1	g1	g1	g1	g1	g1	col.1
h	-	OSR	h1	h1	h1	h1	h1	h1	DU
i	●	LP	i1	i1	i1	i1	i1	i1	OFF
j	-	-	j1	j1	j1	j1	j1	j1	S
k	-	EP	k1	k1	k1	k1	k1	k1	-
l	-	VPS	l1	l1	l1	l1	l1	l1	H
m	-	-	m1	m1	m1	m1	m1	m1	M(2)
n	-	-	n1	n1	n1	n1	n1	n1	-
o	-	LP	o1	o1	o1	o1	o1	o1	col.2

GRID ASSIGNMENT



SS133



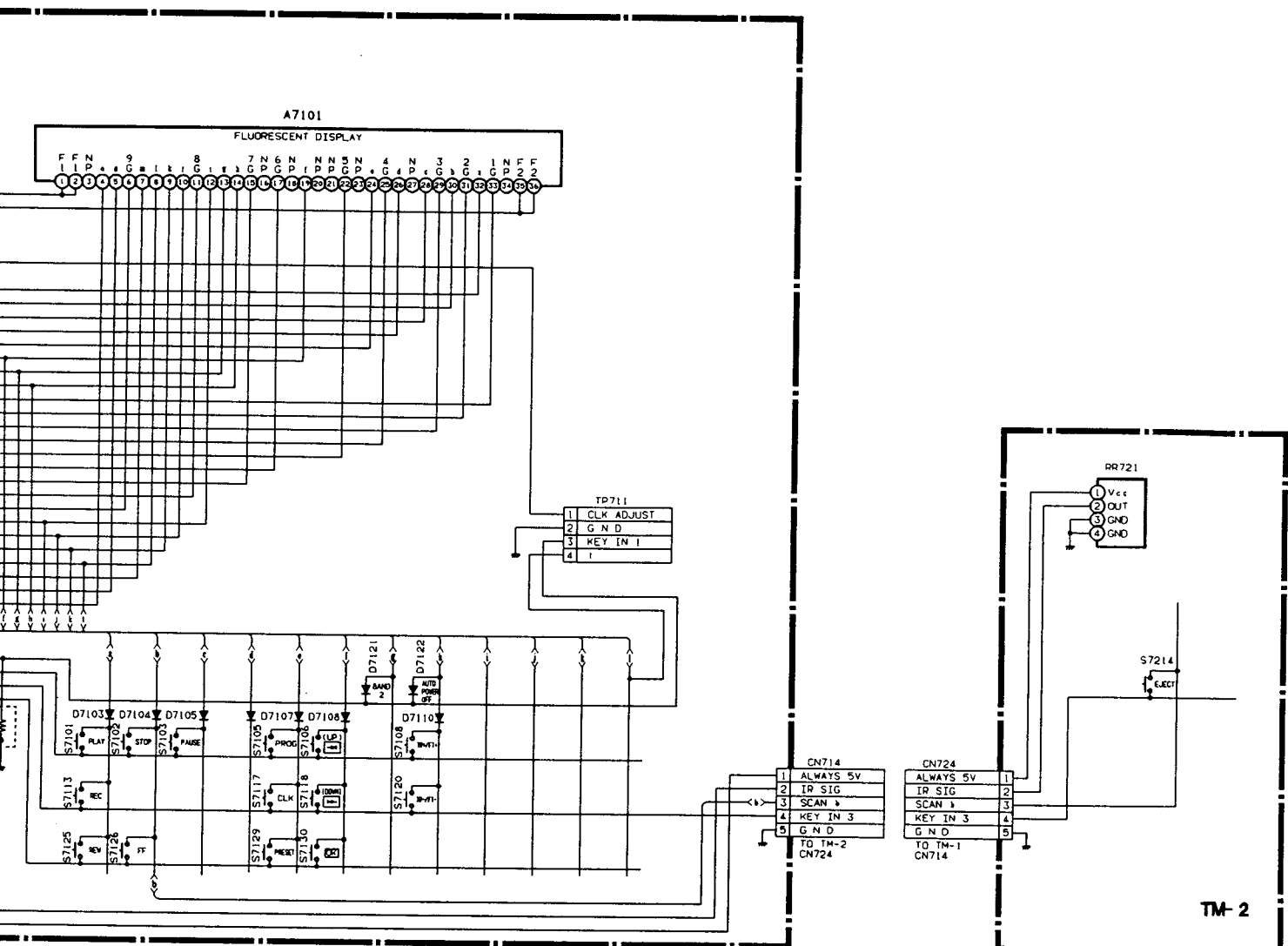
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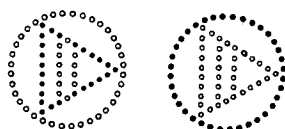
—105—

—105—

CONTROL CIRCUIT DIAGRAM CH CIRCUIT DIAGRAM

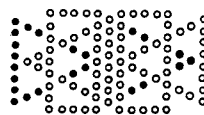


9G: GRAPHIC MODE DISPLAY

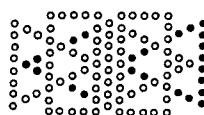


Pattern A

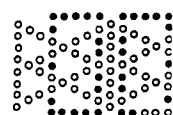
Pattern B



Pattern E

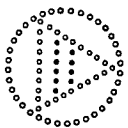


Pattern F

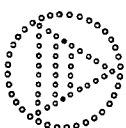


Pattern G

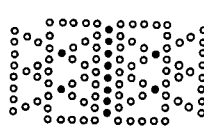
(* : FLD ON)



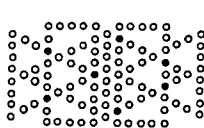
Pattern C



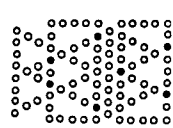
Pattern D



Pattern H



Pattern I



Pattern J

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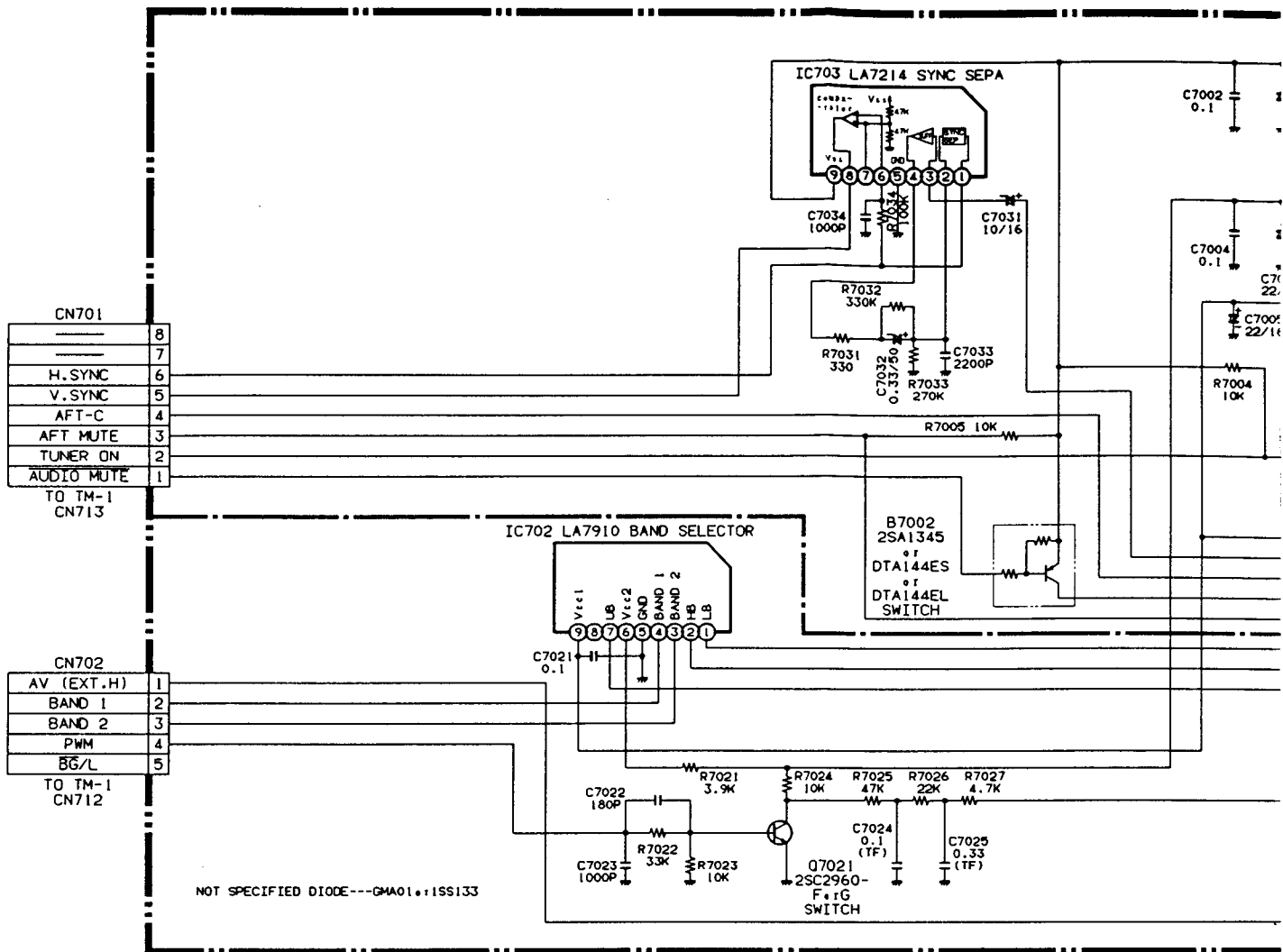
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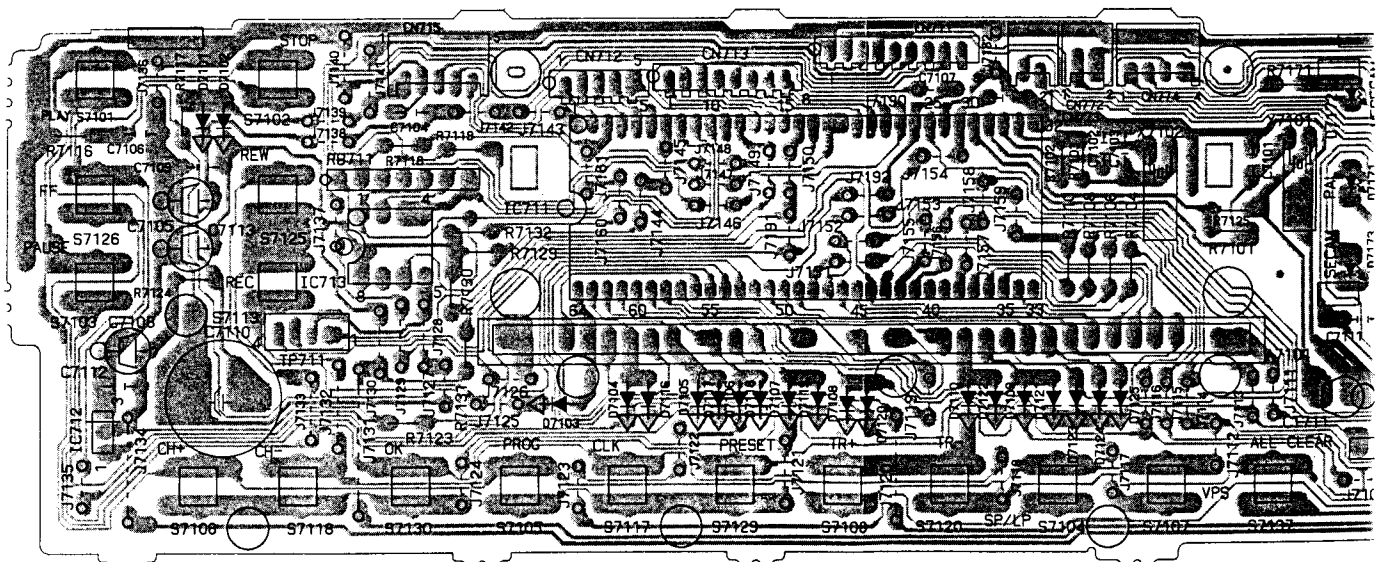
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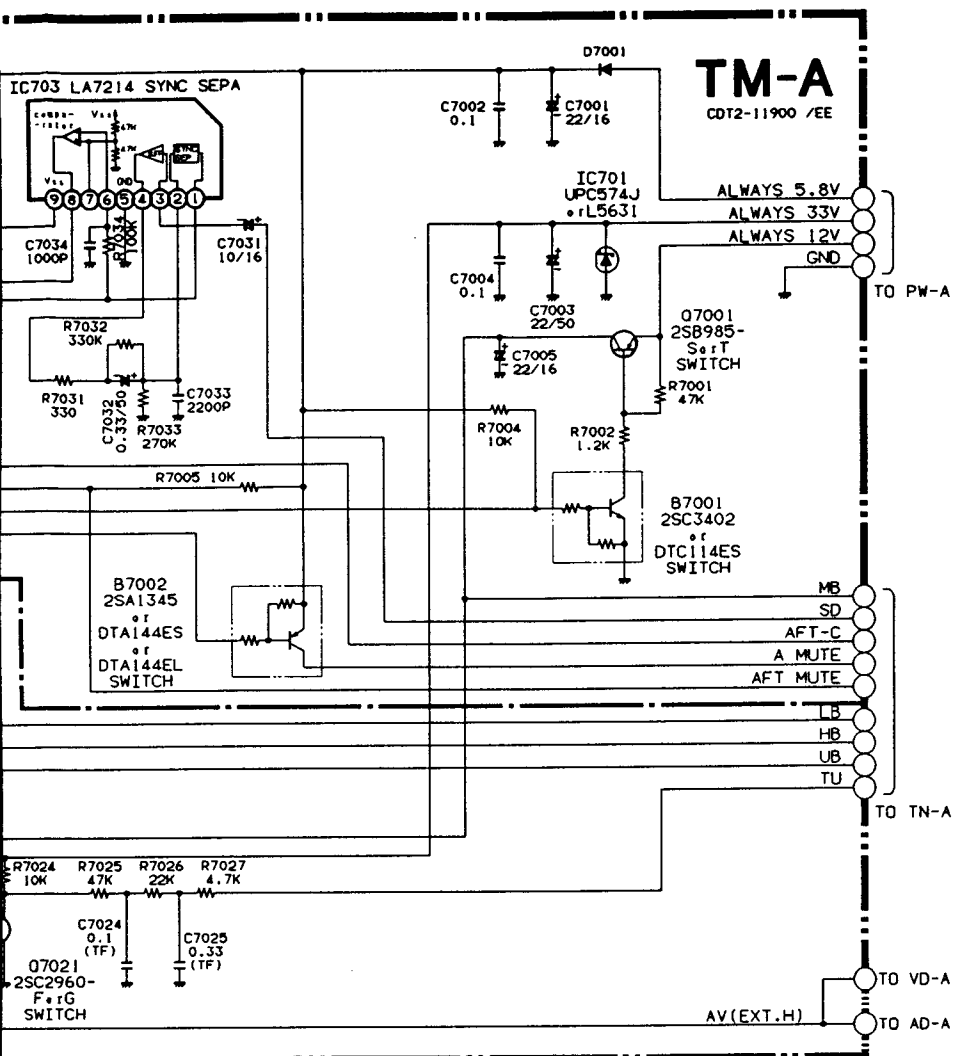
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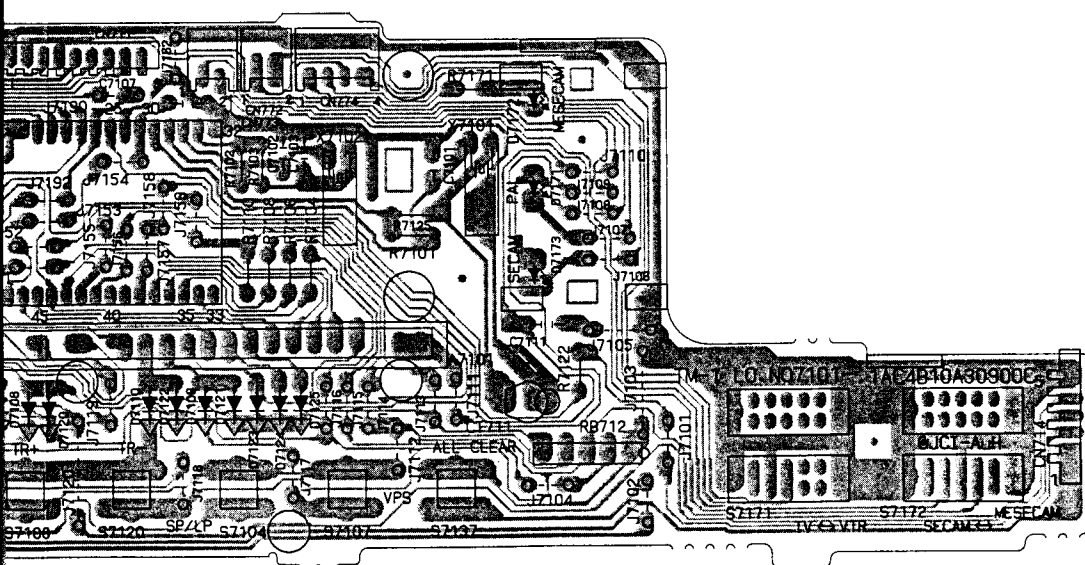


9-16. TM-1 DISPLAY, TIMER & TUNING CONTROL P.C.B.





PLAY, TIMER & TUNING CONTROL P.C.B.



24

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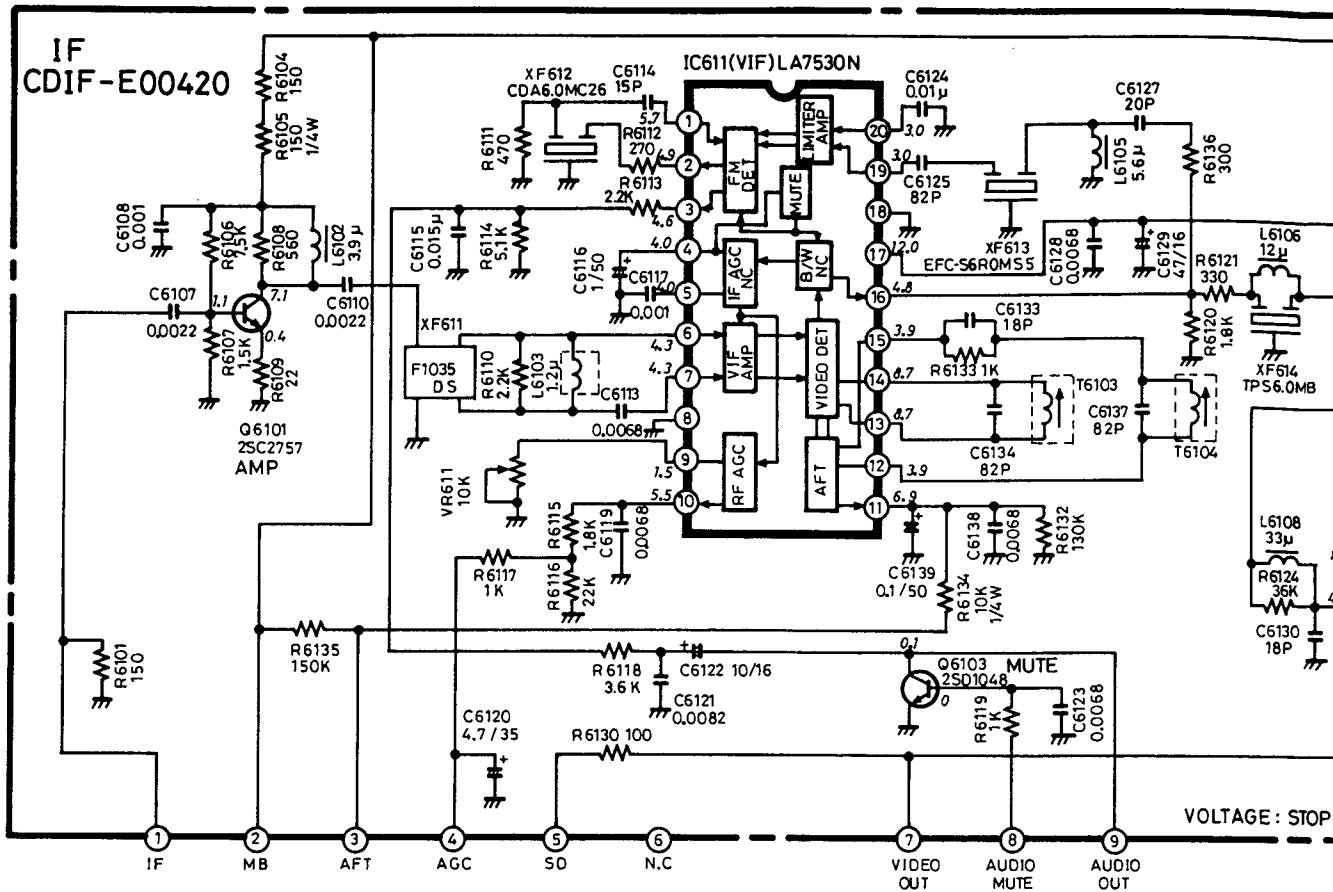
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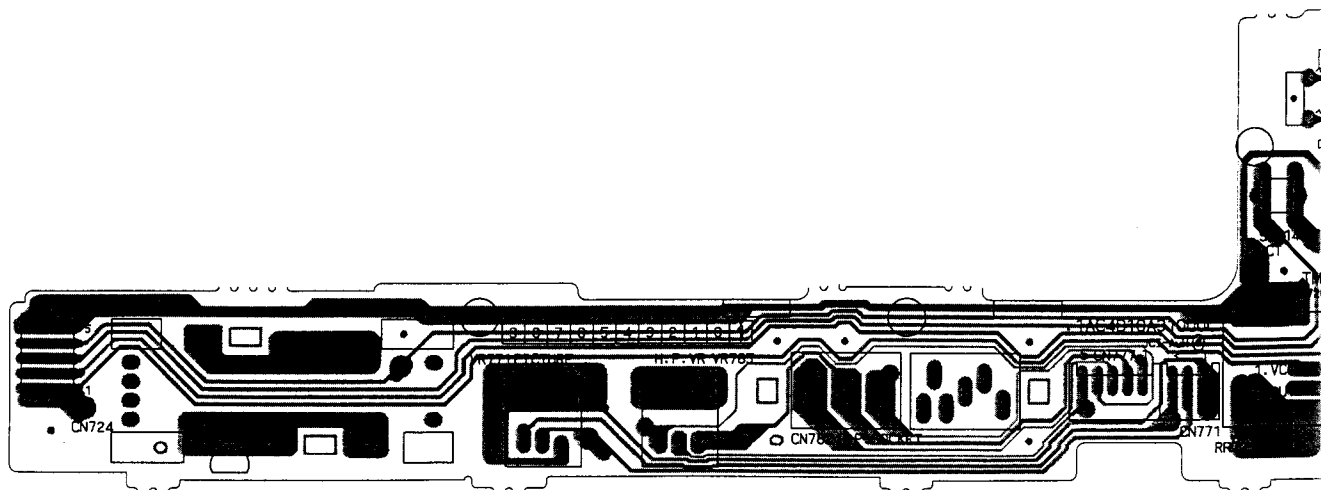
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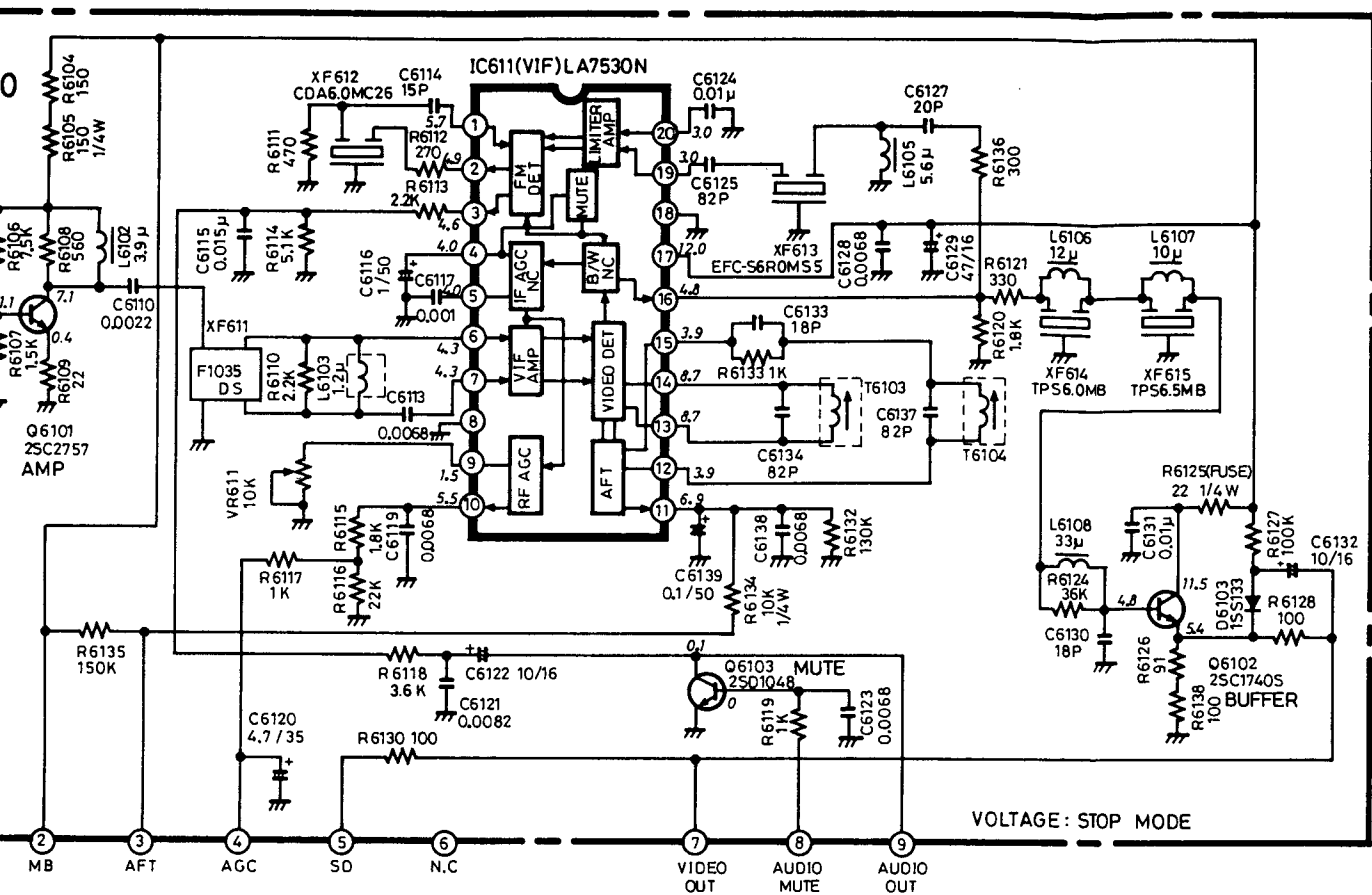
9-17. IF CIRCUIT DIAGRAM



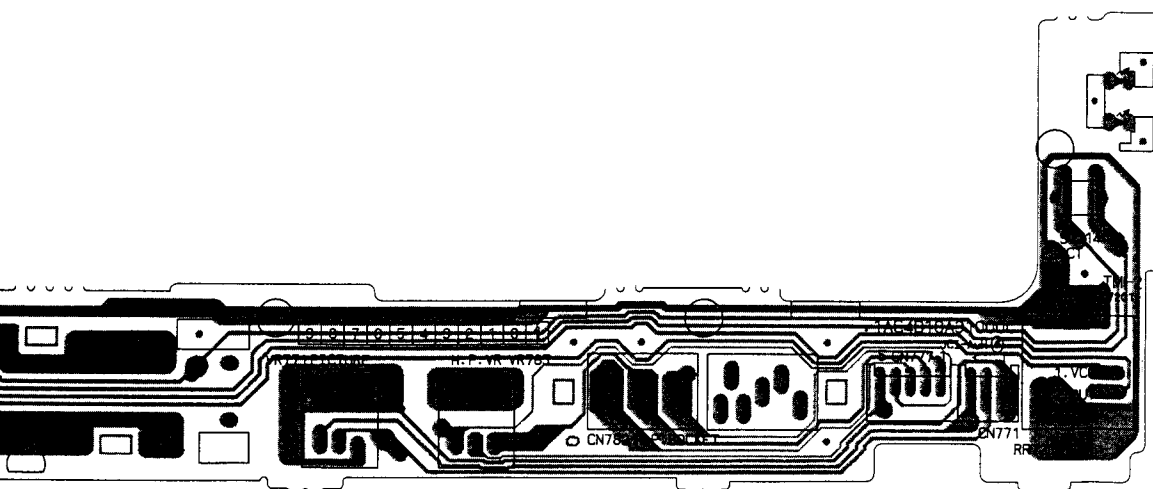
9-18. TM-2 IR RECEIVER & EJECT SWITCH P.C.B.

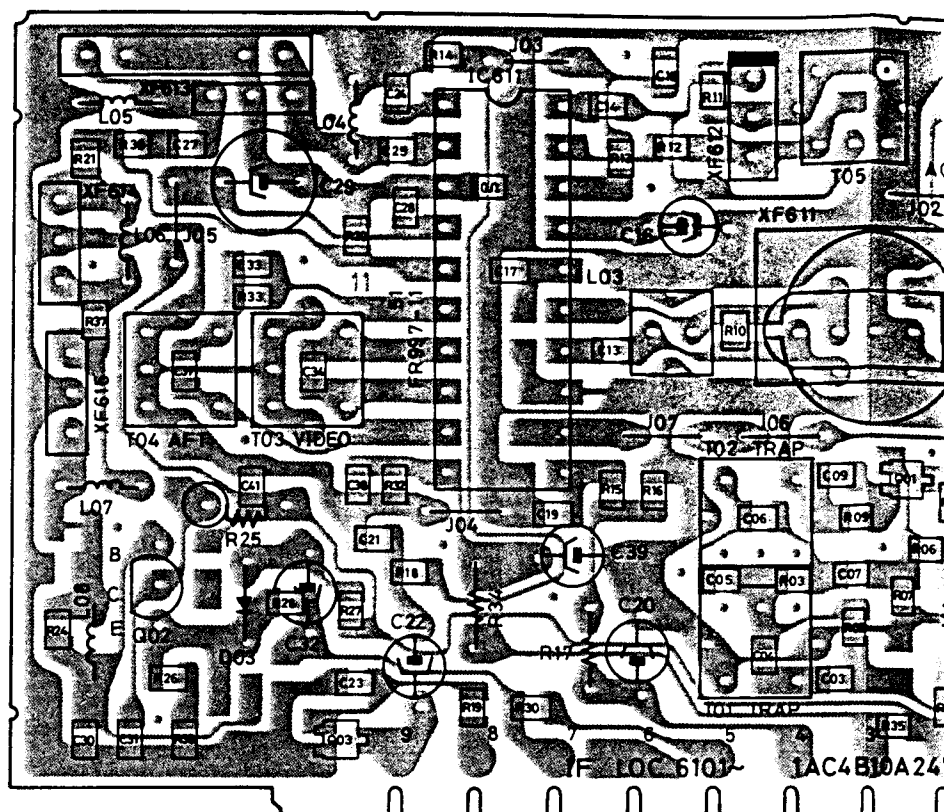
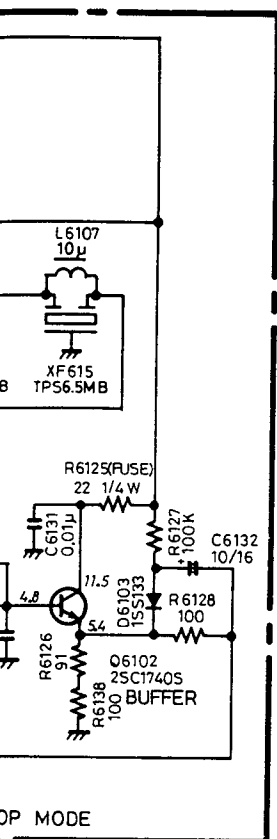


9-17. IF CIRCUIT DIAGRAM

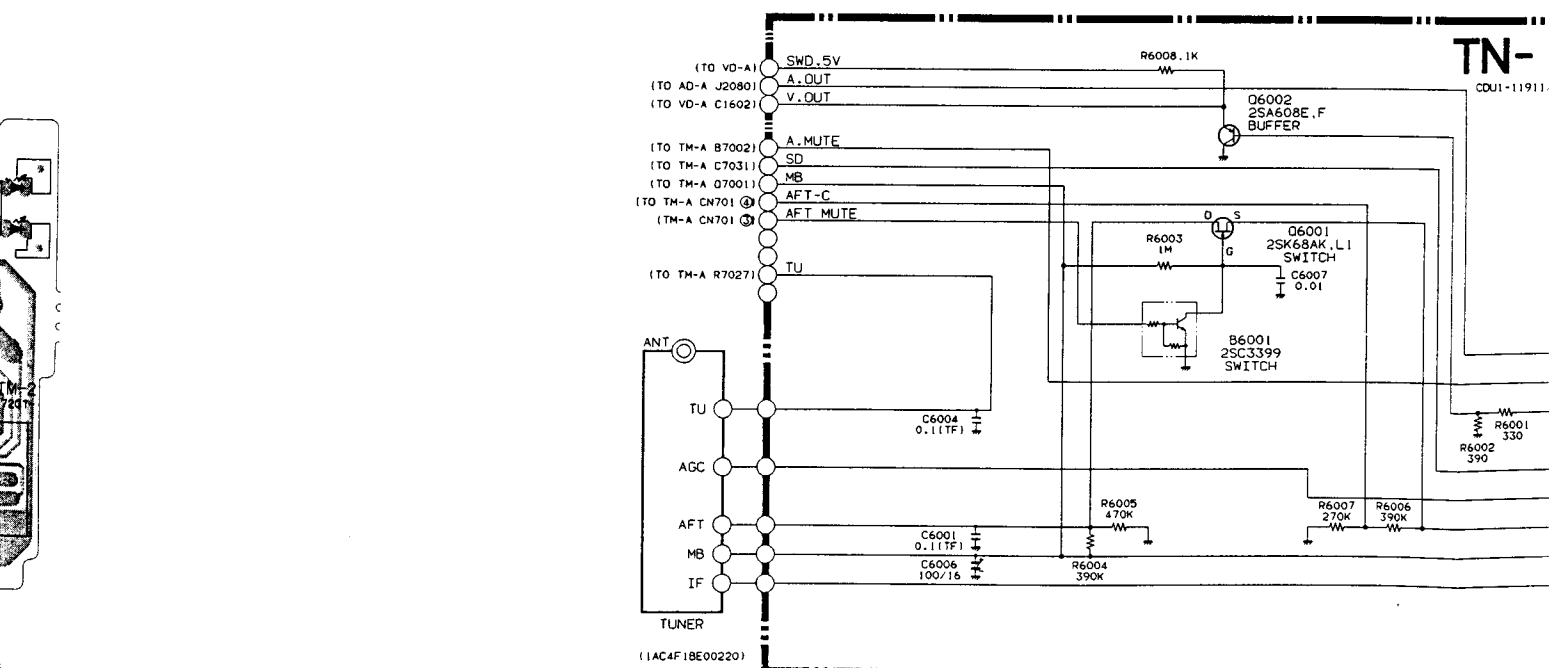


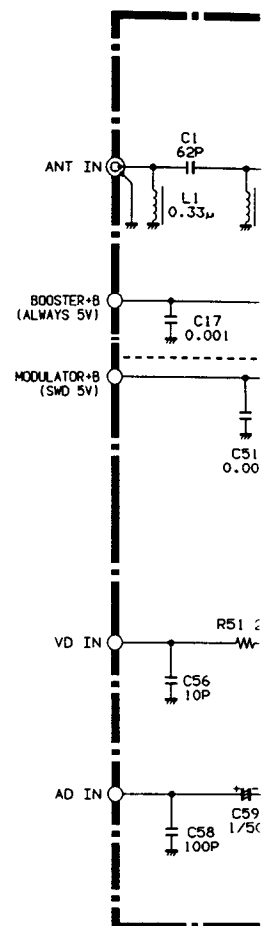
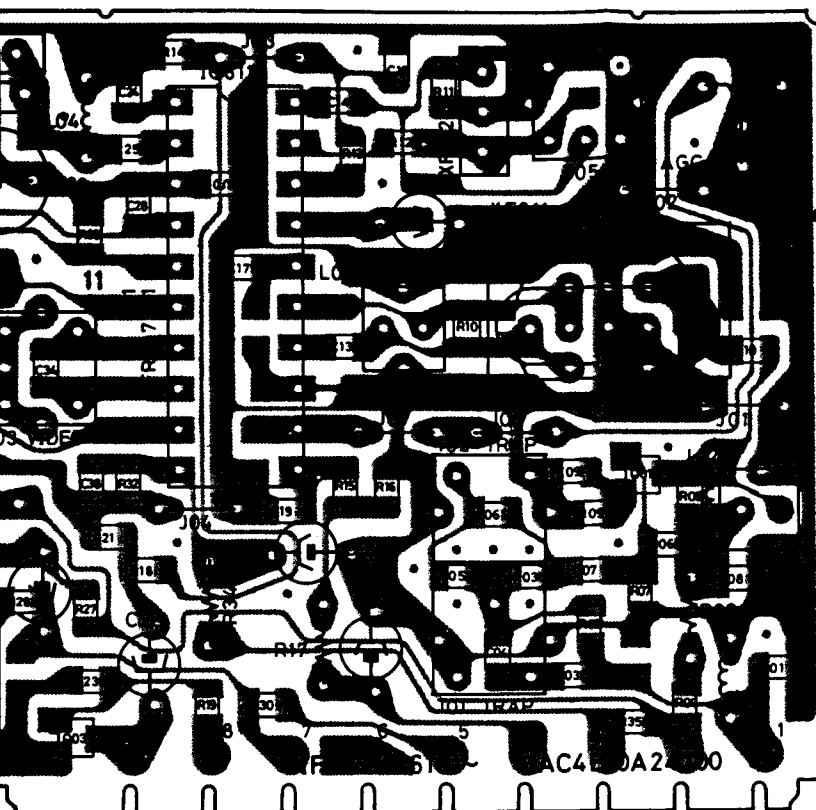
9-18. TM-2 IR RECEIVER & EJECT SWITCH P.C.B.



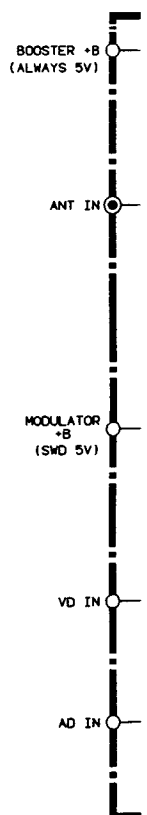
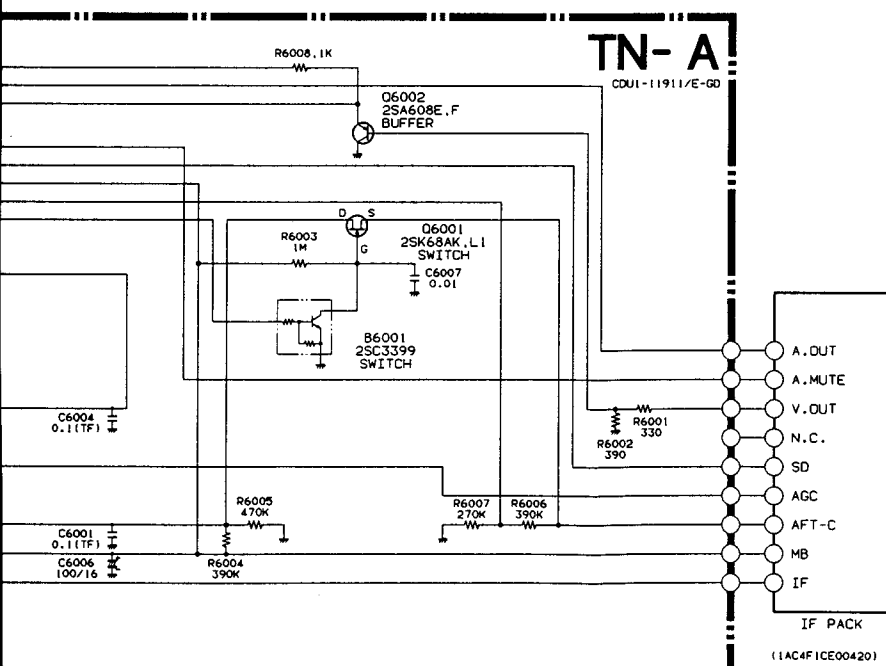


9-20. COMPL. CP-A (TN-A) TUNER IF CONNECTION CIRCUIT DIA

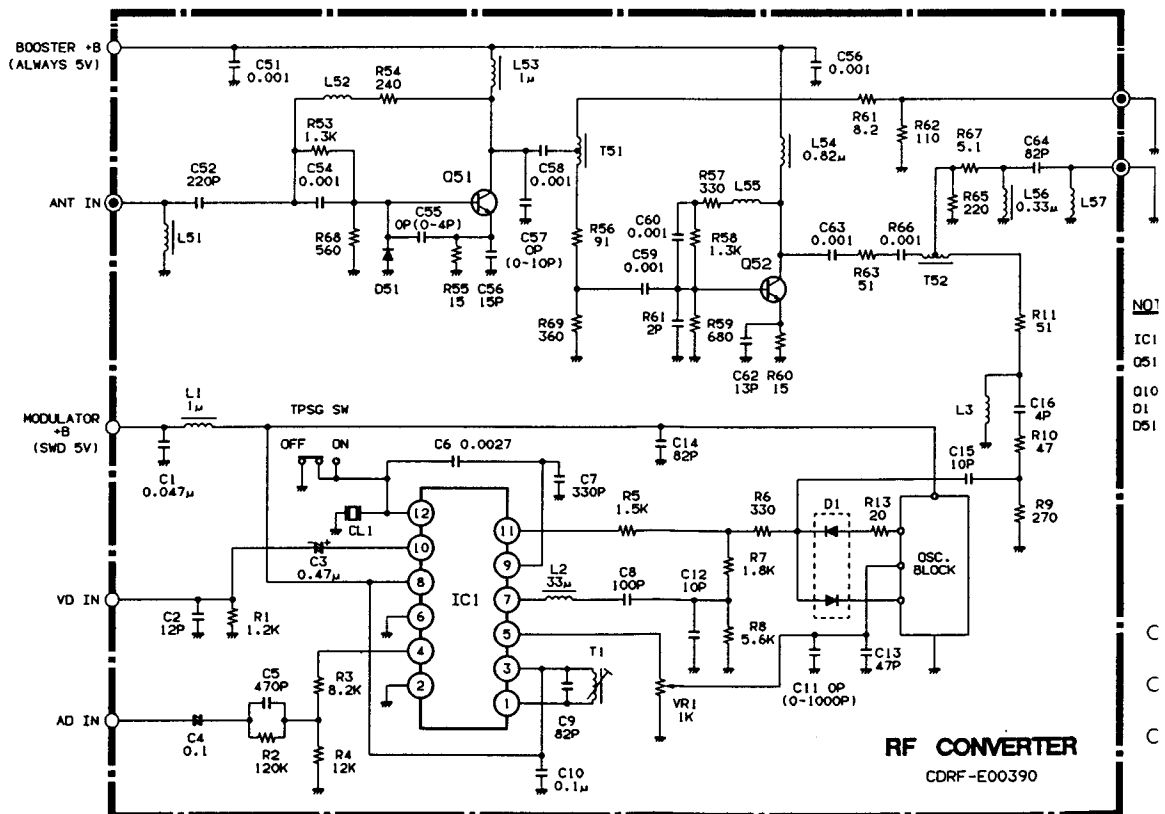
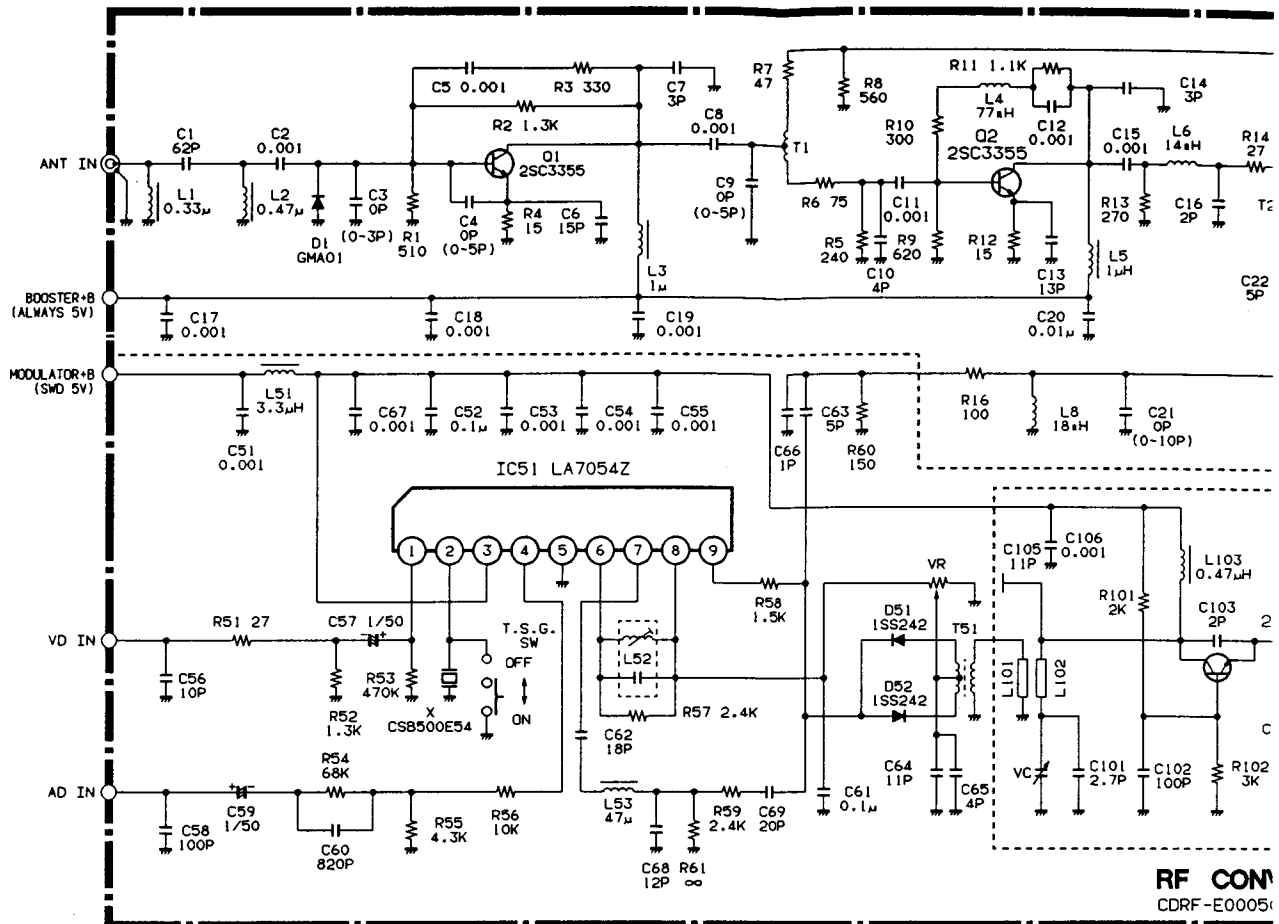




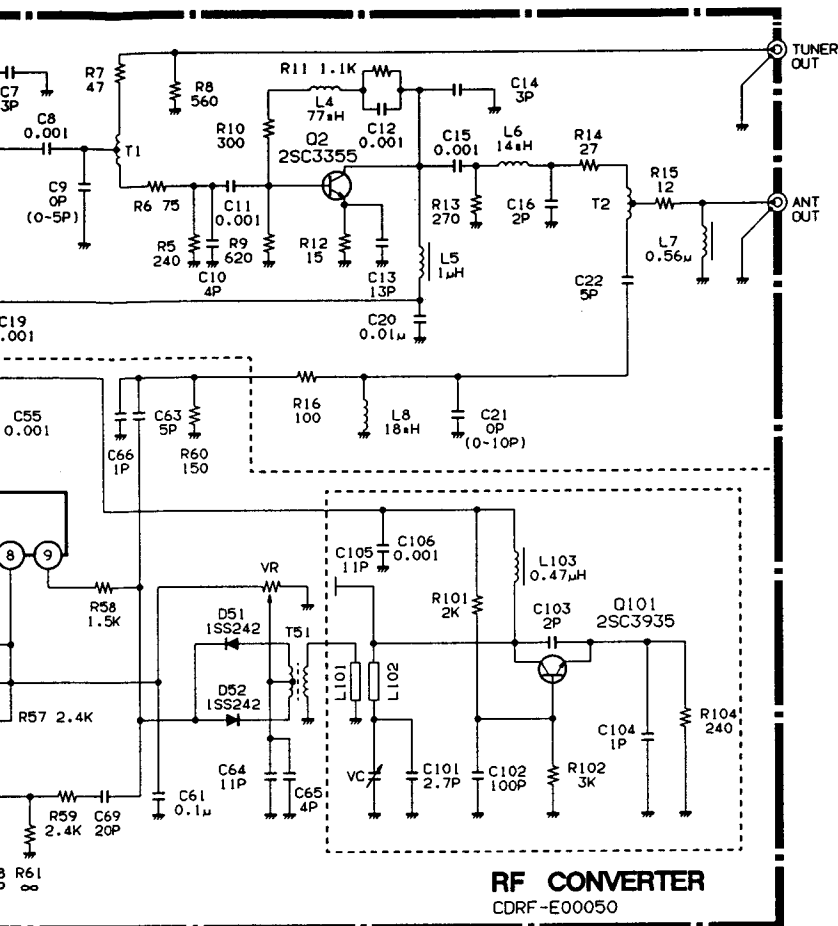
PL. CP-A (TN-A) TUNER IF CONNECTION CIRCUIT DIAGRAM



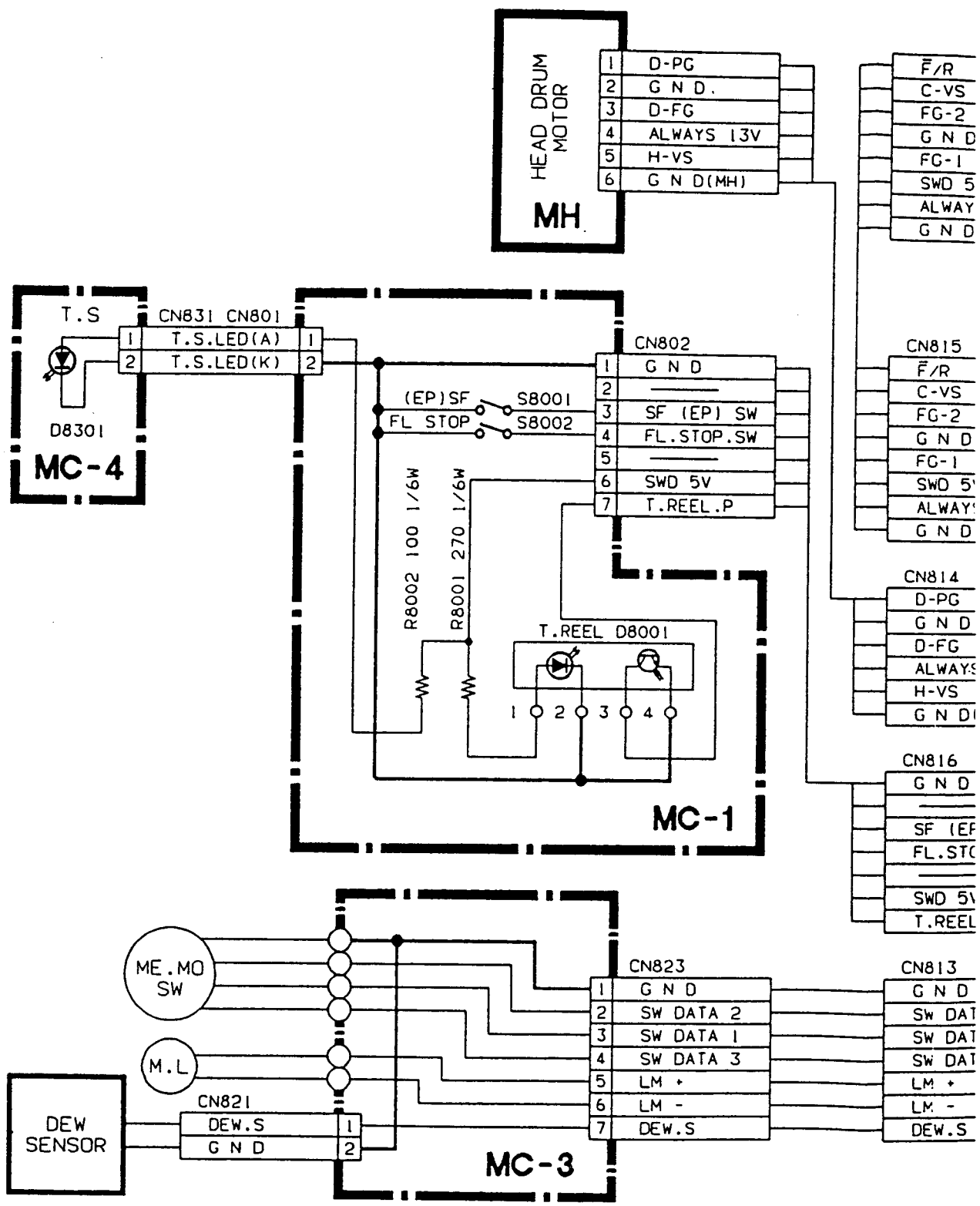
9-21. RF CONVERTER CIRCUIT DIAGRAM



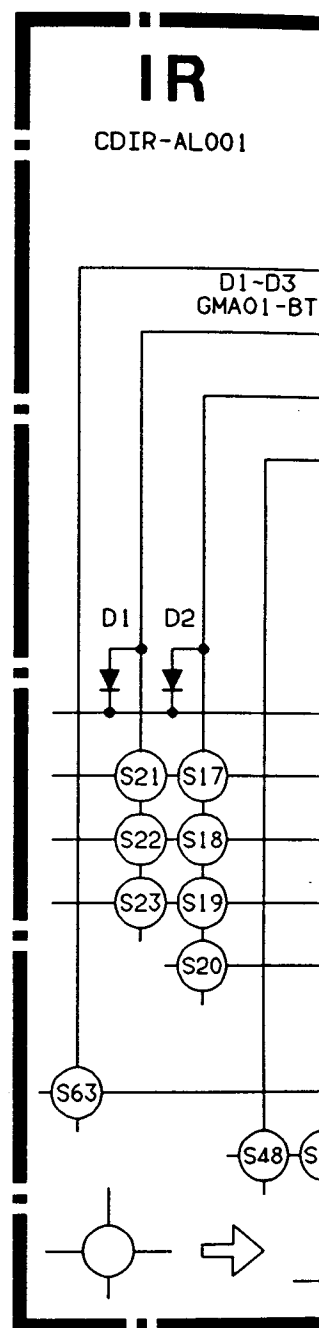
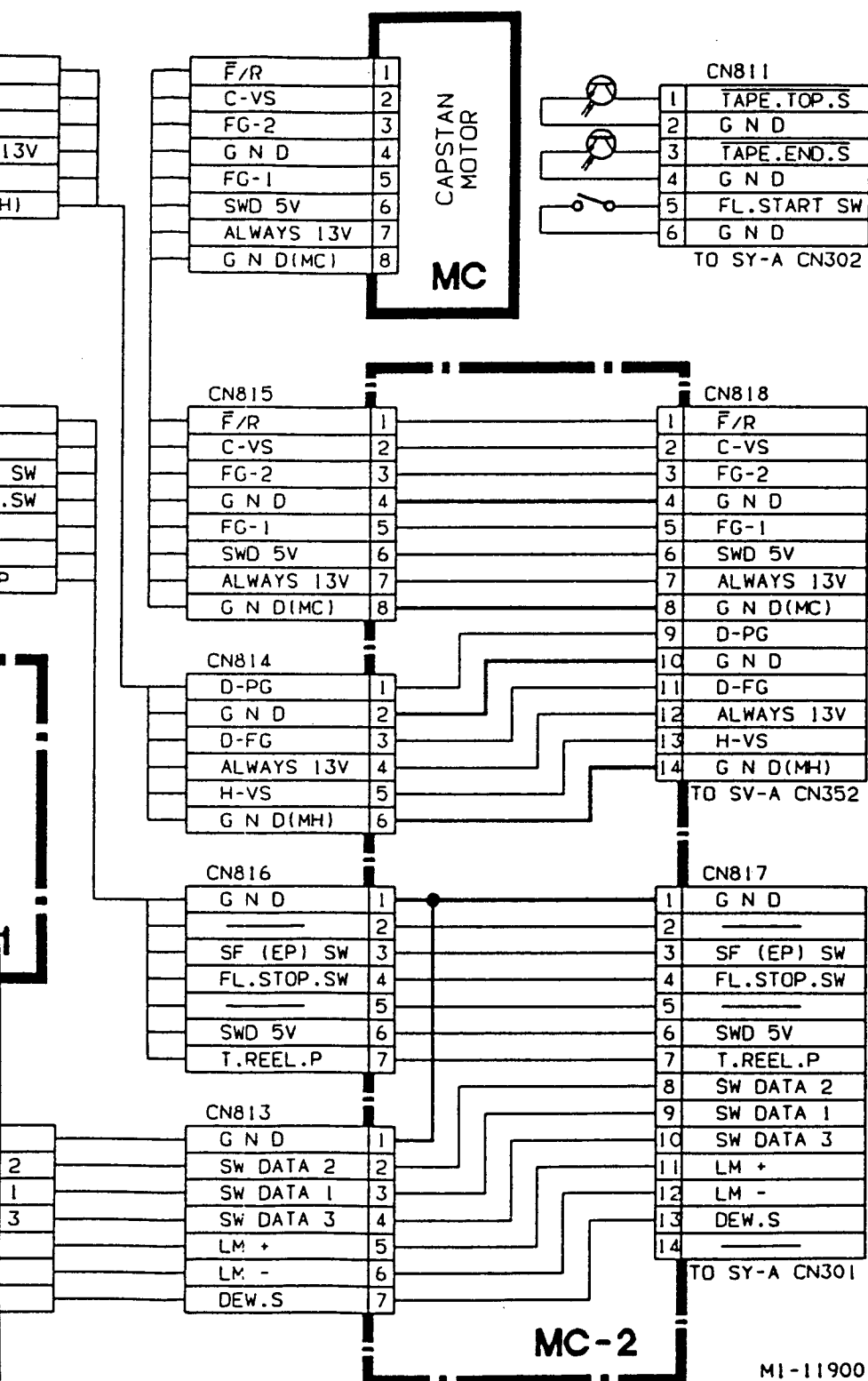
CONVERTER CIRCUIT DIAGRAM



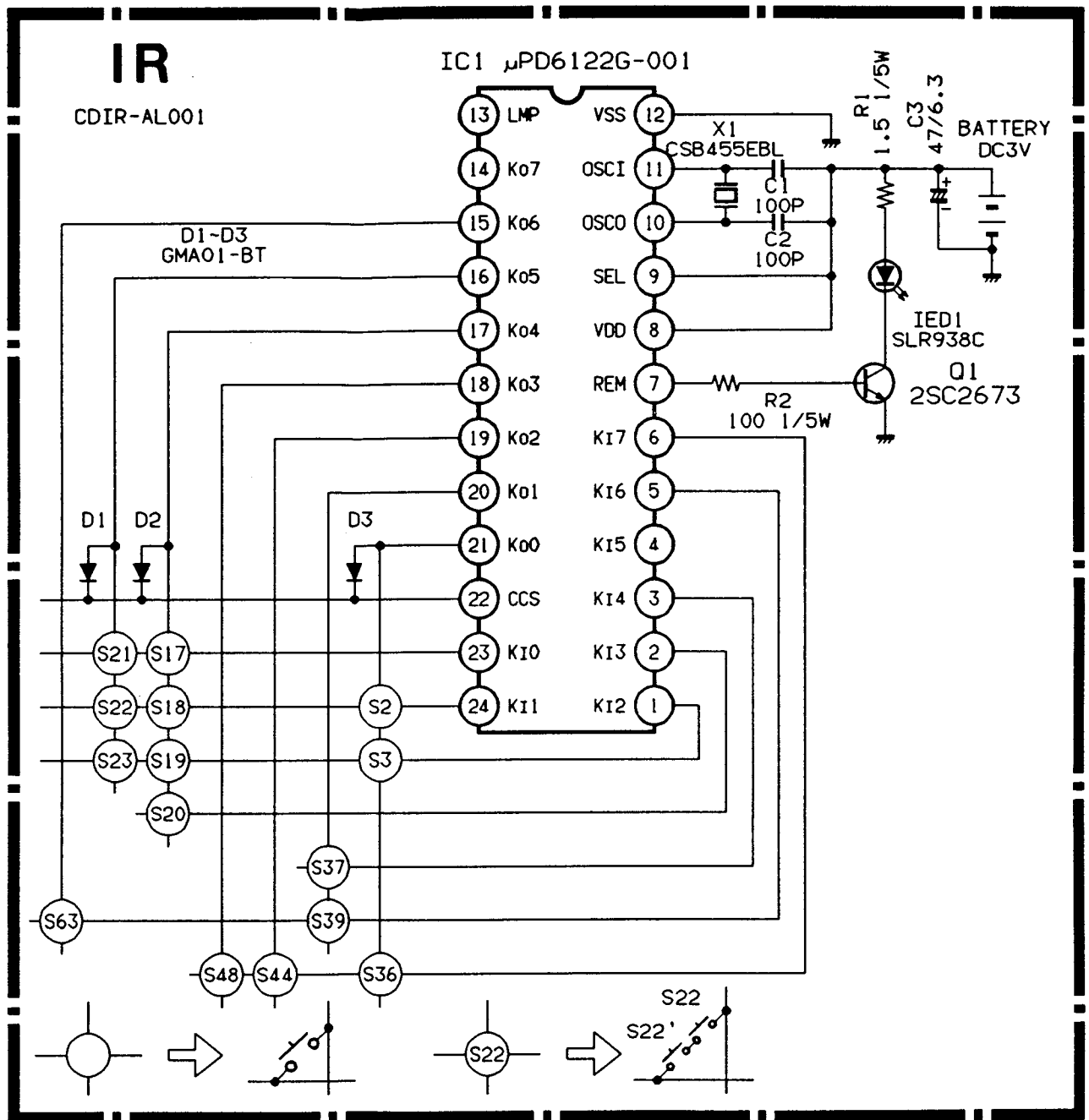
9-22. MECHANISM CONNECTION CIRCUIT DIA



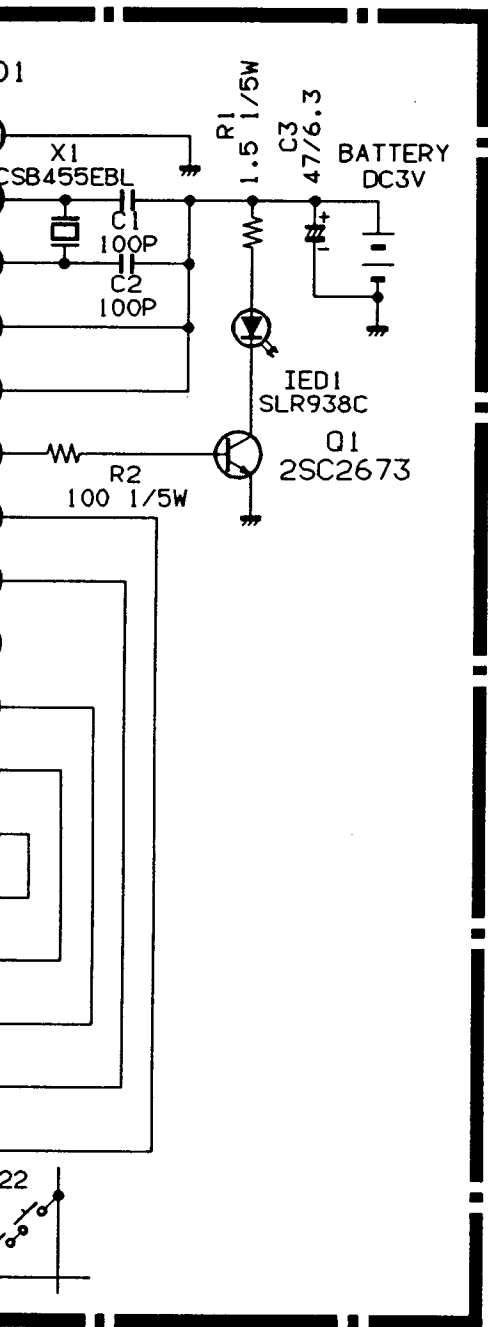
CONNECTION CIRCUIT DIAGRAM



9-23. IR REMOTE CONTROL CIRCUIT DIAGRAM



IT DIAGRAM



AVAILABLE KEY FUNCTION OF REMOTE CONTROL UNIT

KEY NO	FUNCTION	
S2	∧	USE
S3	∨	USE
S17	■ STOP STAND BY	USE
S18	▬ PAUSE STILL	USE
S19	◀ REWIND	USE
S20	FAST-F ▶▶	USE
S21	PLAY ▶	USE
S22	● RECORD	USE
S23	REW-PLAY	USE
S36	MEM/RPT	USE
S37	RESET COUNTER	USE
S39	PROG	USE
S44	OK	USE
S48	VPS	
S63	SP/LP	

IR-00136

KEY FUNCTION
CONTROL UNIT

FUNCTION	
	USE
	USE
OP STAND BY	USE
USE STILL	USE
EWIND	USE
-F ►►	USE
►	USE
CORD	USE
PLAY	USE
RPT	USE
T COUNTER	USE
	USE
	USE
P	

IR-00136

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9-24. IC301 (LC66508B) SYSTEM CONTROL MPU PIN FUNCTIONS TABLE

Pin No.	Input/Output Signal	I/O		Input/Output Function
1	SSB DATA	I	SSB	SSB input/output data
2		O		
3	SSB CLK	O		Clock pulse output to SSB.
4	0/1 CLK	I	External interrupt	CTL signal input for realtime counter.
5	REF 254	I		30Hz pulse. Synchronized to VIDEO in the EE mode, and to the RF switch pulse during playback.
6	—	—		
7	—	—		
8				+5V
9	SW DATA 1	I	Mechanism switch	Switches showing the mechanism position.
10	SW DATA 2	I		
11	SW DATA 3	I		
12	E. P. SW	I		Switch for determining whether cassette recording is possible.
13	—	—		
14	PAL	I	Servo	PAL/NTSC system input. "L" is for PAL.
15	CTL GAIN DOWN	O		CTL AMP circuit gain switching signal. Output at POS SW 2 and less.
16	MC-BR	O		Capstan motor brake signal.
17	—	—	Serial servo data	
18	SV S.DATA	O		Serial data output to the servo IC.
19	SV S.CLK	O		Serial clock pulse output to the servo IC.
20	—	—		
21	—	—		
22	—	—		
23	—	—		
24	—	—		
25	—	—		
26	—	—		
27	—	—		
28	—	—		
29	RF SW P.	I	External	0 to 30Hz pulse. 30Hz during playback, etc.
30	TEST			Ground
31	Vss			Ground
32	OSC1			MPU clock oscillation output pins. Clock frequency is 4MHz.
33	OSC2			
34	RESET	I		MPU initial setting or all-clear.
35	DOC P.	I	External interrupt	* Pulse with an amplitude greater than 0 and smaller than 33ms. STILL noise shifting pulse (output in the STILL mode).
36	SP/LP	I		Tape speed selection command signal input.
37	C. FG P.	I		0 to approx. 6kHz pulse. The frequency required for recognition is approx. 300Hz.
38	ML-F	O	Motor drive	Forward direction loading command signal (FL, TL).
39	ML-R	O		Reverse direction loading command signal (FL, TL).
40	ML-L	O		Low loading speed command signal.
41	ML-M	O		Medium loading speed command signal.
42	REC H	O	Video	Recording command signal.
43	P. B. HIGH	O		Playback screen output command signal.
44	STILL+SLOW+X2S	O		(Output in the STILL, SLOW and X2S modes).
45	SPECIAL PLAY	O		Output in the special playback (CUE, REV, STILL, SLOW, F.ADV, A. DUB PAUSE) modes.
46	ANT/VIDEO	O		ANT/VIDEO switching signal.
47	—	—		
48	—	—		
49	REF VOLT	I	Sensor	Reference voltage for the microcomputer built-in comparator.
50	REEL P.	I		0 to approx. 300Hz pulse. Its period changes according to reel table rotation.
51	DEW S.	I		For dew detection.
52	TAPE TOP S.	I		For tape winding start detection.
53	TAPE END S.	I		For tape winding end detection.
54	FL SW	I	Mechanism switch	Front loading mechanism switch (3 values input: Low = cassette out; medium = FL mode; high = cassette loading completed).
55	TAPE SPEED	I	Servo	Result of tape speed detection by the servo system (high = LP; low = SP).
56	A · MUTE	O	Audio	Audio output inhibiting indication signal.
57	A · REC MUTE	O		Normal audio output and recording inhibiting indication signal.
58	—	—		
59	—	—		
60	—	—		
61	POWER UP	O	Power supply	Output always except when power is off.
62	—	—		
63	CAP. M.	I	Option	For kind of Capstan motor detection.
64	VDD			+5V

P66508

9-25. IC351 (LC7416) DIGITAL SERVO IC PIN FUNCTIONS TABLE

Pin No.	I/O Terminal Name	I/O	Input/Output Function
1	FSC IN	I	Input for the IC internal system clock pulse. A level of at least 0.3 V _{pp} is required. The color subcarrier signal is input by capacitive coupling.
2	V _{ss}		Ground
3	C-SYNC	I	Composite sync signal input.
4	VD	O	Dummy V _D signal output.
5	NC	—	NC
6	NC	—	NC
7	RF-SW-PULSE	O	Video head switching pulse output.
8	AF-SW-PULSE	O	Audio head (FM) switching pulse output.
9	DL1	I	Dummy V _D insertion position control CR.
10	CTL-IN	I	Control signal input.
11	REMAK	O	Outputs the control signal re-recording control signal. Three-value output (H, M, L).
12	REC-CTL	O	Recording control signal output. Three-value output (H, OPEN, L).
13	NC	—	NC
14	D-PG. MM	I	CR for drum PG signal delay.
15	D-PG	I	Drum PG signal input.
16	NC	—	NC
17	D-FG	I	Drum FG signal input.
18	DSE	O	Outputs the speed error for drum system speed control. An output making the drum motor stop is delivered when DRUM-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
19	FHE	O	Outputs the horizontal sync signal of the composite sync signal after F-V conversion (using the drum phase control system). The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
20	DPE		Error output for drum system phase control. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
21	C-START/STP	O	Outputs the capstan motor start and brake pulses in the slow mode.
22	CSE	O	Capstan system speed error output. An output making the capstan motor stop is delivered when CAP-ON is "0". The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
23	CPE	O	Capstan system phase reciprocal error output. The lower three bits of the output data forms R-2R ladder network and the 4th bits for DAC (D/A Converter) and upper 5th to 8th bits for PWM (Pulse Width Modulation).
24	F/R	O	Capstan motor forward/reverse control output. "1" sets the reverse mode, and "0" the forward mode.
25	C-FG1	I	Capstan FG signal input.
26	NC	—	NC
27	NC	—	NC
28	EP/LP/SP	O	Recording mode output. Three-value output ("H" is for EP mode, "M" for LP mode and "L" for SP mode).
29	SP	O	Recording mode output. "H" is for SP mode.
30	CAP-BRK	I	Control input for capstan brake timing. (MC-BR)
31	TRK-CR	I	CR for tracking adjustment.
32	NC	—	NC
33	D-WD1	I	CR for drum compensation timing adjustment in the slow mode.
34	NC	—	NC
35	REF-TRK	O	Outputs the tracking delay input signal.
36	MODE (×2+STILL)	O	Mode decoding signal output. At the ×2 SPEED mode and starting time of SLOW/STILL mode, output "H" level.
37	NC	—	NC
38	1/0-CK	O	Outputs the CTL signal for realtime counter.
39	SV-S · CLK	I	Serial transmission clock pulse input.
40	SV-S · DATA	I	Serial data input terminal.
41	NTSC/PAL	I	NTSC/PAL switching input. "H" is for NTSC, "L" for PAL.
42	V _{DD}		+5V supply terminal

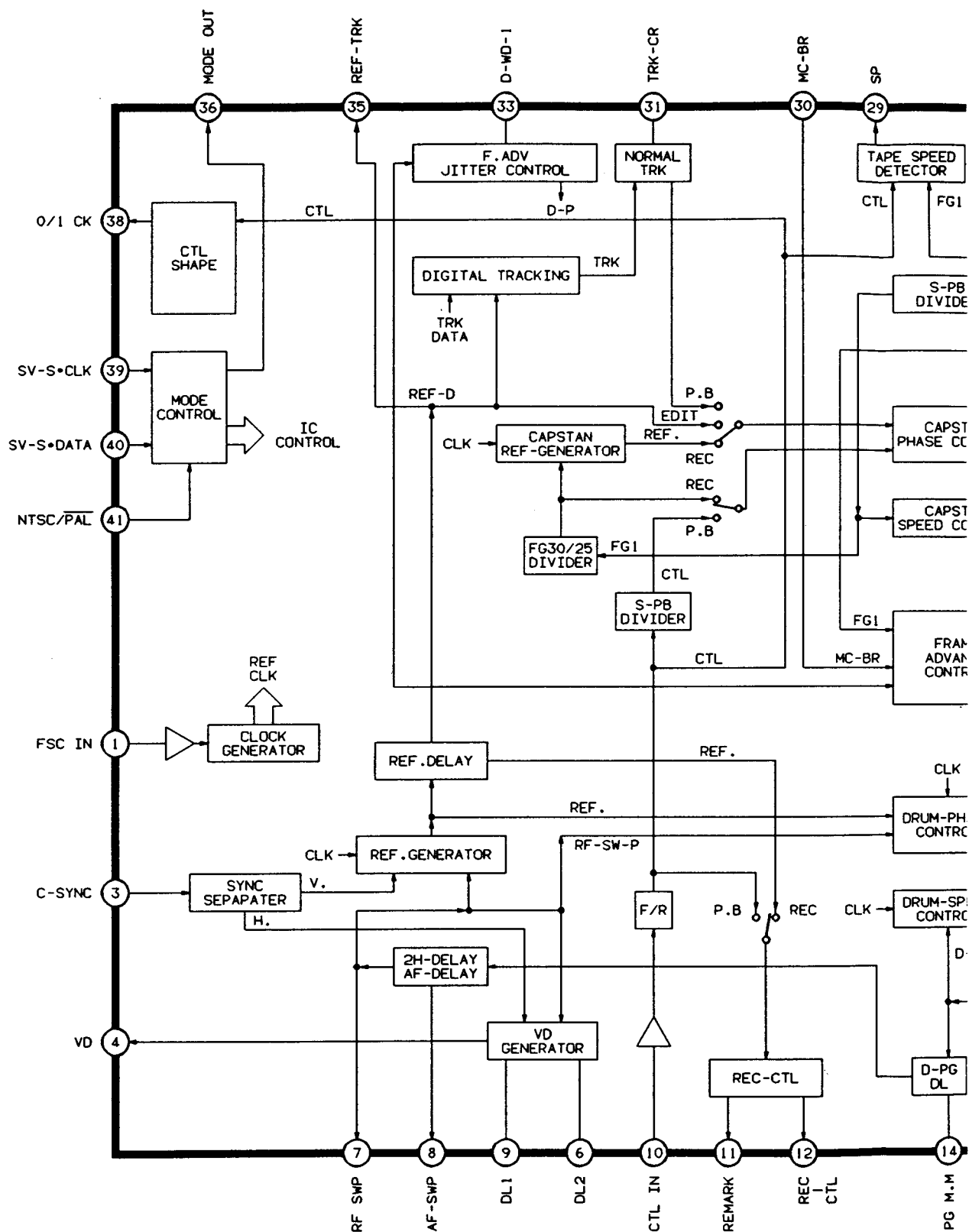
LC7416

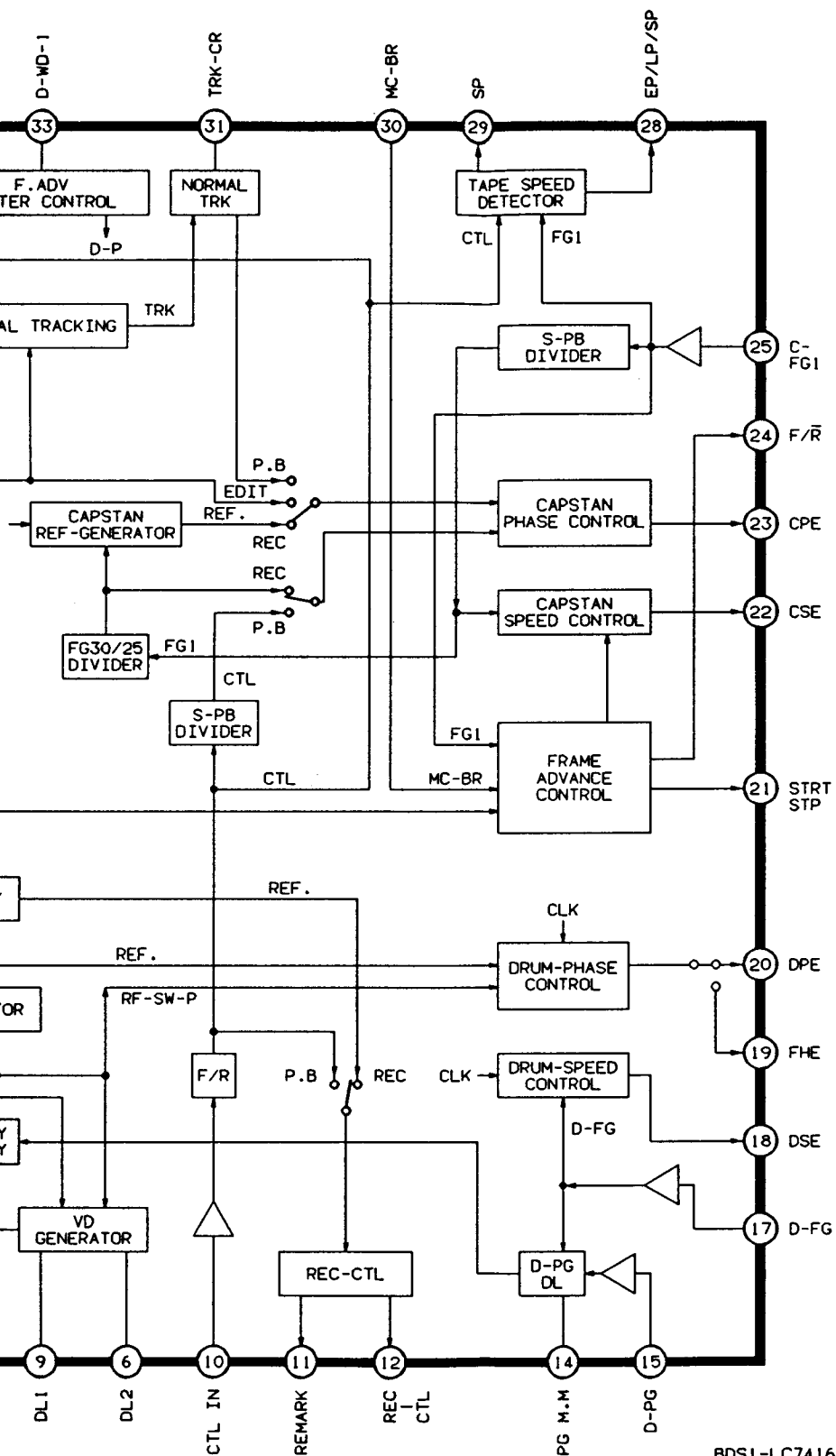
9-26. IC711 (M50957) TIMER MPU PIN FUNCTIONS TABLE

Pin No.	Port	Input/Output Signal	I/O	Input/Output Function
1	Vcc			+ 5V
2	P6s	AV	O	"H" output when an external input is received.
3	P64	SC	O	"H" during simulcast.
4	P63/PWM3	BAND1	O	Band data output (BAND1, BAND2)
5	P62/PWM2	BAND2	O	(L, L) = VHF-LOW (L, H) = VHF-HIGH (H, L) = UHF (H, H) = SKIP
6	P61/PWM1	PWM	O	Tuning voltage output.
7	P60/T	ADJUST	O	Pulse output (6.29MHz/128) for clock frequency adjustment.
8	P27	CLK	O	Clock pulse output to the E ² PROM.
9	P26	DI	I/O	Data exchange with the E ² PROM.
10	P25	E ² PROM CS ^T	O	E ² PROM 1 is accessed when "L".
11	P24	BG/L	O	Transmission system switching ("H" = PAL BG; "L" = SECAM L).
12	P23	NC		NC
13	P22	TUNER ON	O	"H" output when tuner power is ON.
14	P21	AUDIO MUTE	O	"L" output during AUDIO MUTE.
15	P20	AFT MUTE	O	"H" output during AFT MUTE.
16	P37/Sr _{dy}	POWER DOWN	O	Power failure mode set at "L" input.
17	P36/CLK	SCLK	I	SSB clock pulse input.
18	P35/Sout	SOUT	O	SSB data output.
19	P34/Sin	SIN	I	SSB data input.
20	P33/ANin	AFT.C	I	AFT.S curve input.
21	P32/CNTR	H.SYNC	I	Horizontal sync signal input for existence channel discrimination.
22	P31	SCL	O	Clock pulse output to the VPS decoder IC.
23	P30	SDA	I/O	Data exchange with the VPS decoder IC.
24	P53/INT1	V. SYNC	I	Vertical sync signal input for existence channel discrimination.
25	P52/INT2	REMOCON	I	Remote control signal input.
26	CNV _{ss}			Ground.
27	RESET			Reset terminal.
28	Xin			6.291456MHz clock terminal.
29	Xout			
30	Xcin			32.768kHz (clock OSC used in the power failure mode)
31	Xcout			
32	Vss			Ground
33	φ			
34	P57	KEY IN4	I	Key inputs
35	P56	KEY IN3	I	
36	P55	KEY IN2	I	
37	P54	KEY IN1	I	
38	Vp	Vp		-30V
39	P51	NC	—	NC
40	P50	NC	—	NC
41	P17	o	O	Display segment outputs. (Included key-scan output)
42	P16	n	O	
43	P15	m	O	
44	P14	l	O	
45	P13	k	O	
46	P12	j	O	
47	P11	i	O	
48	P10	C9	O	Display grid outputs.
49	P07	C8	O	
50	P06	C7	O	
51	P05	C6	O	
52	P04	C5	O	
53	P03	C4	O	
54	P02	C3	O	
55	P01	C2	O	
56	P00	C1	O	
57	P47	h	O	Display segment outputs. (Included key-scan output)
58	P46	g	O	
59	P45	f	O	
60	P44	e	O	
61	P43	d	O	
62	P42	c	O	
63	P41	b	O	
64	P40	a	O	

P50957

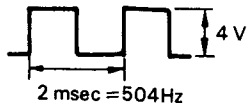
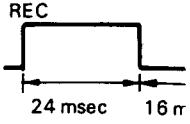
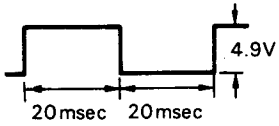
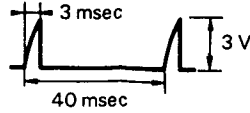
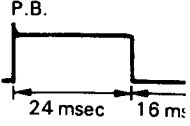
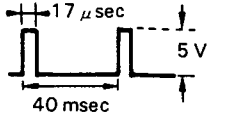
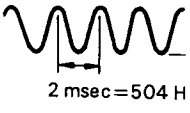
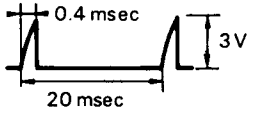
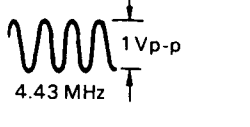
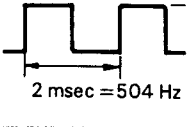
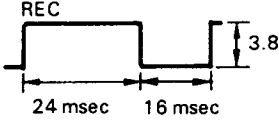
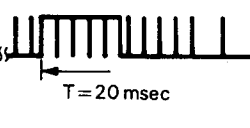
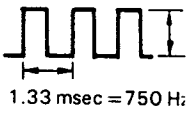
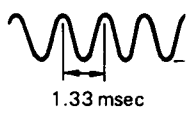
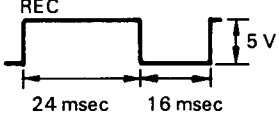
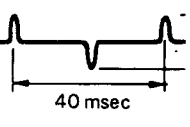
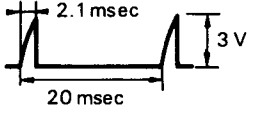
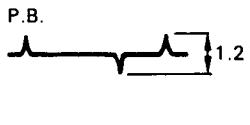
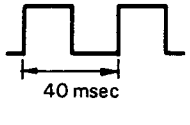
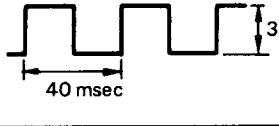
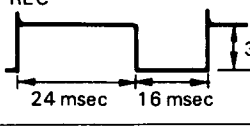
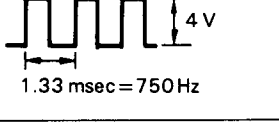
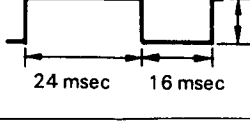
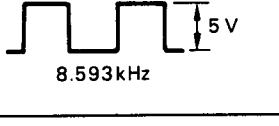
9-27. IC351 (LC7416) DIGITAL SERVO IC INTER BLOCK DIAGRAM





IC351 (L)	
⑦	 20 msec
⑧	 20 msec
⑨	 0.4 msec 20 msec
⑩	REC 24 msec
	P.B. 24 msec
⑫	REC 24 msec
⑭	 2.1 msec 20 msec
⑮	 40 msec
⑰	 1.33 msec
⑱ ⑳ ㉑ ㉒ ㉓	 8.59 msec

9-28. WAVEFORM OF SERVO CIRCUIT

IC351 (LC7416)		②⑤			①⑤	
⑦		③①				
⑧		③⑧			②④ ②⑥	
⑨		①			②③	
⑩		③			②⑦	
		IC352 (LA7123)			②⑧	
⑫		③			②⑨	
⑭		④			③⑩	
⑮		⑦ ⑧				
⑰		⑫				
⑱ ⑲ ⑲ ⑲						

4 V ec = 504 Hz		REC 3.8 V 24 msec 16 msec
3 V	⑮	P.B. 3.9 V 24 msec 16 msec
5 V	⑳ ㉔	1.2 Vp-p 2 msec = 504 Hz
1 Vp-p 504 Hz	㉓	4 V 2 msec = 504 Hz
3.7 V 20 msec	㉗	4 V 1.33 msec = 750 Hz
LA7123)	㉘	10 mVp-p 1.33 msec
40 mV	㉙	150 mVp-p 40 msec
1.2 Vp-p	㉚	3.9 V 40 msec
3.2 V 16 msec		
5 V 16 msec		